

I would like to submit the following comment responding to the NSF announcement stating its intent to restructure critical weather science infrastructure at NCAR.

My expertise in brief: Applied climate scientist with 27 years in Ocean and Climate Physics at Lamont-Doherty Earth Observatory of Columbia University, specializing in climate variability, hydroclimate extremes, and impacts on agriculture, water resources, and risk.

My comments:

I am writing as a climate scientist and regular user of NCAR-enabled data and modeling resources to urge the National Science Foundation (NSF) not to fracture or dismantle the National Center for Atmospheric Research (NCAR) and its facilities. The proposed restructuring of this critical weather and climate science infrastructure would irreversibly weaken national capabilities in forecasting, climate risk assessment, and fundamental research that directly protect lives, property, and the economy.

NCAR was established by NSF in 1960 to advance fundamental understanding of the atmosphere and Earth systems in service of public safety. Over more than six decades, it has evolved into a uniquely integrated national and international hub that combines observations, numerical modeling, supercomputing, field campaigns, and community software and data services. This integration is not incidental. It is foundational. NCAR's structure enables rapid feedbacks between observing emerging phenomena, understanding underlying physical processes, improving models, and delivering tools used by operational partners and end users. No single university, agency, or contractor can replicate this end-to-end capability (Palmer, 2026; Martinez, 2026).

Recent statements have suggested that NCAR's activities could be redistributed among other entities "without loss," preserving "vital" functions while divesting or privatizing others. The scientific record strongly contradicts this premise. Fragmenting NCAR would dismantle tightly coupled teams, shared infrastructure, and long-term research programs that together produce outcomes far greater than the sum of their parts. Such disaggregation would degrade national weather and climate services, slow innovation, and increase risk to communities and critical sectors that depend on accurate, timely environmental information (Martinez, 2026; Palmer, 2026).

NCAR's integrated model directly supports public safety. Its scientists and engineers have advanced forecasting of severe storms, aviation hazards, compound extremes, and air-quality impacts, translating massive streams of atmospheric data into operationally relevant guidance for federal, state, and local agencies and private partners. These contributions depend on sustained collaboration across observational systems, modeling frameworks, and high-performance computing. These capabilities are inseparable in practice (Palmer, 2026).

NCAR is also indispensable for long-term climate research and risk assessment. A central example is the NCEP/NCAR Reanalysis I, developed jointly by NOAA and NCAR, which provides one of the longest continuously updated global atmospheric datasets, spanning from 1949 to the present (Kalnay et al., 1996; Kistler et al., 2001). As a regular user of this reanalysis in climate variability and extremes research, I rely on its stability, documentation, and ongoing maintenance. Any disruption to the institutional ecosystem that supports reanalysis production, including data assimilation, quality control, model development, and user support, would represent a major setback for both scientific understanding and applied climate-risk work.

The impacts of dismantling or fragmenting NCAR would propagate across sectors vital to the United States.

Agriculture and food security. NCAR underpins climate and weather tools used for drought, flood, and heat-wave preparedness, informing planting decisions, irrigation planning, and resilience investments. Weakening these capabilities would reduce early warnings and increase exposure to climate shocks (Martinez, 2026).

National security. Defense and intelligence agencies depend on specialized environmental modeling and expertise originating at NCAR. Scientists have warned that dismantling NCAR would pose national security risks because these capabilities cannot be rapidly reproduced elsewhere (Martinez, 2026).

Infrastructure, energy, and water systems. NCAR research informs the design and operation of energy grids, transportation corridors, and water infrastructure exposed to compound hazards such as concurrent heat waves and peak electricity demand or storms producing both extreme winds and precipitation (Palmer, 2026).

Scientific innovation and workforce development. NCAR's role as a shared national facility provides unmatched training and collaboration opportunities for students and early-career scientists across U.S. universities. Fragmentation would splinter this ecosystem and weaken the pipeline of future atmospheric and climate scientists (Palmer, 2026).

These discussions are occurring amid political efforts to dismantle NCAR and redistribute or privatize its core capabilities. Scientists and scientific organizations have raised concerns that such actions would degrade weather prediction, climate research, and the science that protects the public (Martinez, 2026; Palmer, 2026).

From a technical standpoint, the issue before NSF is not whether individual NCAR programs are valuable. They demonstrably are. The question is whether these activities will remain part of a coherent national center that leverages shared infrastructure and multidisciplinary teams, or be scattered into disconnected components. The evidence overwhelmingly supports the former. NCAR's integrated structure enables it to deliver outsized societal benefit relative to cost (Palmer, 2026; Martinez, 2026).

I respectfully offer the following recommendations:

1. Preserve NCAR as a unified national center. NSF should explicitly commit to maintaining NCAR's integrated mission and organizational structure.
2. Strengthen open, community-serving science. NCAR's community models, data services, and training programs must remain openly accessible and not be privatized or restricted.
3. Protect continuity of long-term datasets and modeling systems. Reanalysis products such as NCEP/NCAR Reanalysis I, along with associated documentation and support, must remain stable and continuously updated (Kalnay et al., 1996; Kistler et al., 2001).
4. Engage independent scientific review focused on societal outcomes. Any restructuring should be evaluated by diverse experts with deep knowledge of weather and climate science, emphasizing impacts on forecast skill, climate-risk assessment, public safety, and national security.
5. Recognize NCAR as national scientific infrastructure. Like national laboratories in other domains, NCAR provides foundational capabilities that support multiple agencies and the broader economy. Decisions affecting this infrastructure warrant exceptional caution and transparency.

NSF's Dear Colleague Letter invites input on the value and benefits of NCAR's programs as you consider future directions for critical weather and climate science infrastructure. From the

standpoint of someone who relies directly on NCAR-enabled datasets and tools, and in alignment with concerns raised by scientific peers, I strongly urge NSF to keep NCAR whole. Fragmentation or dismantling would substantially degrade the nation's ability to anticipate and respond to weather and climate hazards at precisely the moment those capabilities are most needed.

Thank you for the opportunity to comment and for your consideration of the scientific and societal implications of this decision.

Sincerely,



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