To: NSF Office of the Director
Subject: Response to NSF 26-203 Dear Colleague Letter: NSF Intent to Restructure Critical Weather Infrastructure

Dear NSF Leadership,

We write as faculty and researchers in Earth system science and engineering at Johns Hopkins University, writing as individuals, to respond to NSF 26-203 regarding the potential restructuring of critical weather research infrastructure. Our work spans atmospheric science, oceanography, hydrology, fluid dynamics, and environmental systems. Much of our research has been made possible through the observational facilities, modeling systems, supercomputing resources, and scientific expertise of the National Science Foundation's National Center for Atmospheric Research (NSF NCAR).

Johns Hopkins University was one of the founding universities of the University Corporation for Atmospheric Research (UCAR), created to ensure that the nation's universities could collectively address the most challenging problems in atmospheric science. That original vision of shared national infrastructure supporting collaborative research remains essential today.

We appreciate NSF's commitment to ensuring that research infrastructure evolves to meet national needs. However, we strongly reject the premise that NSF NCAR should be fundamentally restructured in ways that fragment its core capabilities. At a time when severe weather risks are growing and the nation's economic and security interests increasingly depend on accurate environmental prediction, the United States needs a stronger and more integrated national capability, not a dispersed one.

Improving prediction of hazardous weather is a problem of national scale. Tornadoes, hurricanes, floods, atmospheric rivers, wildfires, and drought cause tens of billions of dollars in annual economic losses and threaten lives, infrastructure, agriculture, and energy systems. Accurate prediction and response are therefore critical not only for public safety but also for economic competitiveness and national security. Electric grid stability, transportation networks, water resources, and coastal infrastructure all depend on advances in environmental prediction.

These challenges require coordinated Earth system science research that integrates atmospheric, oceanic, land-surface, and hydrologic processes and addresses gaps in current knowledge. Extreme weather events often emerge from interactions spanning thousands of kilometers and multiple components of the Earth system. Addressing these events requires

interdisciplinary teams of meteorologists, oceanographers, hydrologists, engineers, and data scientists working together with advanced observational and computational infrastructure.

NSF NCAR has served as the nation's central hub for this work for more than six decades. Its facilities enable large-scale field campaigns involving research aircraft, radar systems, dropsonde networks, and ocean and land observing systems operated by universities, federal agencies, and international partners. Equally important, NSF NCAR provides the operational coordination and logistical expertise required to manage these complex multi-institutional efforts.

Just as critical today are NSF NCAR's supercomputing and modeling capabilities. Modern weather and climate prediction increasingly depend on high-performance computing, advanced numerical models, and AI-enabled data science. Community models and forecasting testbeds supported by NSF NCAR allow researchers across the nation to develop, evaluate, and improve predictive systems. NSF NCAR also plays an essential role in transfer of knowledge and research to operations activities that ultimately benefit operational forecasting and hazard preparedness. These integrated capabilities represent a strategic national asset.

NSF NCAR is also essential for training the next generation of scientists, engineers, and data scientists who will lead the nation's environmental prediction enterprise. Its community modeling systems, supercomputing resources, and large field campaigns provide unparalleled opportunities for graduate students and early-career researchers to gain experience with advanced observational technologies, high-performance computing, and interdisciplinary team science. This training pipeline strengthens the workforce that supports U.S. leadership in weather forecasting, climate science, and environmental risk management.

Fragmenting this infrastructure across institutions would weaken the nation's ability to address the most pressing problems in weather prediction. Large-scale team science requires centralized coordination, shared facilities, and a common scientific platform. Distributing these capabilities would make it significantly more difficult to conduct the integrated observational, modeling, and computational research necessary to improve forecasts of high-impact weather and address fundamental gaps in knowledge of atmospheric and oceanic dynamics.

The United States faces growing risks from extreme weather and environmental hazards. At the same time, advances in computing, data science, and Earth system modeling are opening unprecedented opportunities to improve prediction and preparedness. Realizing these opportunities requires a strong national center capable of coordinating facilities, expertise, and computing resources for the entire research community.

For these reasons, we urge NSF to preserve and strengthen NSF NCAR's role as the nation's central hub for collaborative Earth system research. Maintaining this capability is essential to advancing weather prediction, protecting lives and infrastructure, supporting economic resilience, and sustaining U.S. leadership in atmospheric science.

Respectfully,

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