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Response to Dear Colleague Letter: NSF Intent to Restructure Critical Weather Infrastructure

In our individual capacities as former directors of the NSF National Center for Atmospheric Research (NCAR) serving consecutively from 1986-2018, we write with a profound sense of urgency regarding the recent communications concerning the Center's future. While we recognize that institutions must periodically evolve, we must be clear: any path that leads to the fragmentation or dismantling of NSF NCAR is fundamentally not in the nation's interest.

As a strategically integrated scientific ecosystem, NSF NCAR's collective value far exceeds its individual components. Beyond academic research, the Center serves as a vital pillar of the nation's public-safety and economic infrastructure. By bridging the gap between fundamental research and operational application, NSF NCAR generates immense economic value for the Nation, providing the foundational intelligence that protects commerce, reduces disaster-related losses, and optimizes weather-sensitive industries like energy, insurance and logistics.

Its technical leadership includes developing wind shear detection systems that revolutionized aviation safety and pioneering GPS dropsondes, which have improved hurricane track forecasts. NSF NCAR's solar research, including the suite of custom-designed ground-based instruments that provide unprecedented observations of the solar corona, support NOAA requirements to improve space weather prediction, strengthening the nation's ability to protect the power grid and satellite operations. These efforts, alongside sophisticated fire behavior modeling and advances in storm-scale forecasting, provide the early warnings essential for navigating extreme weather events.

This synergy of innovation also directly fuels NSF NCAR's Earth system modeling, enabling a "seamless prediction" framework that provides intelligence across timescales, from hourly alerts to decadal projections. It is imperative that the United States remains at the leading edge of this predictive science. This is particularly critical as the President has signaled a clear mandate for the U.S. to regain the global lead in numerical weather prediction. The NSF NCAR-NOAA partnership is the primary engine for this ambition; notably, the new prediction model recently announced for future NOAA operations (the Model for Prediction Across Scales, or MPAS) features NSF NCAR science and technology at its core. Fragmenting the Center now would dismantle the very infrastructure required to achieve this national priority.

By advancing aviation safety, emergency management, and agricultural productivity, the Center provides essential services beyond the scope of individual universities or the private sector to maintain. The proposal to redistribute NSF NCAR's core functions threatens the very heart of American atmospheric science. The Center serves as the essential hub where university researchers, federal agencies, and international partners converge to solve problems too vast for

any single institution. This role as a community convener is a key component of the Center's mandate, providing a neutral, stable ground for collaboration that has never been more necessary.

To dissolve this center of gravity is to sever the collaborative ties and the interdisciplinary workforce that produces this life-saving environmental intelligence. Furthermore, as Artificial Intelligence (AI) redefines the future of science, NSF NCAR is uniquely positioned to mobilize the nation's best academic minds to rapidly advance AI-based forecasting for extreme events—a task requiring a level of coordination and workforce development that no other organization can replicate.

Also concerning is the irreparable damage such a dismantling would inflict on the future of the American scientific workforce. NSF NCAR has long served as a premier training ground for the next generation of researchers. By providing graduate students and early-career faculty with access to world-class supercomputing and models, specialized instrumentation, and a mentorship network that spans the globe, NSF NCAR ensures a robust pipeline of talent into our universities, agencies, and the private sector. If these pathways are disrupted, we risk a lost generation of scientists. At a time when our international competitors are significantly investing in science, fragmenting NSF NCAR would be a signal that the United States is withdrawing from scientific leadership in the atmospheric and related sciences.

The impact of NSF NCAR is truly nationwide, serving as an indispensable force multiplier for a scientific community that spans all 50 states and territories. Because most academic departments lack the multi-decadal funding and interdisciplinary expertise required to maintain global community models or operate sophisticated instrumentation and research aircraft, NSF NCAR provides these “big science” tools as an irreplaceable shared public good. From improving the accuracy of hurricane forecasts for the Gulf and Atlantic Coasts to advancing wildfire and smoke-impact modeling essential for the Western U.S., the Center's research addresses our most pressing regional threats. In the Midwest and Plains, NSF NCAR-led studies on deep convective clouds and storms underpin the agricultural economy, while its hydrological research provides the foundation for the U.S. National Water Model (NWM). Operated by NOAA, the NWM has expanded the nation's flood forecasting from 4,000 locations to over 2.7 million river reaches coast-to-coast, ensuring that even the most remote communities have access to life-saving water intelligence. Dismantling this integrated ecosystem would not only fragment the university community but would leave every state less prepared for the environmental challenges of the future.

We have spent over sixty years building a global pillar of excellence that underpins our national capability to understand a changing atmosphere. The primary mandate of the Center is the broad spectrum of atmospheric and weather science that keeps our nation safe. To fragment this capacity now would be a historic strategic error that cedes American leadership at a moment of peak environmental risk. We therefore urge the Foundation to reconsider any path that leads to the weakening of this national treasure and instead double down on NSF NCAR's proven mission to convene the community and enable the discovery that keeps our nation safe and competitive. We stand united in our commitment to NSF NCAR's mission and are ready to engage in a rigorous

defense of the integrated model that has served the United States, its universities, and the global scientific community so well for over six decades.

Sincerely,

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