

To: The National Science Foundation

From: University of Alaska Fairbanks
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RE: Future of NCAR, response to DCL "NSF Intent to Restructure Critical Weather Infrastructure" (vetted by premier UAF atmospheric researchers)

The University of Alaska Fairbanks (UAF) strongly opposes any fragmentation, relocation, or dismantling of NSF NCAR as an integrated national center. This is not merely a question of scientific efficiency — it is a matter of national security, Arctic readiness, and long-term U.S. leadership in Earth system science.

What NSF NCAR Actually Does

A persistent misperception must be addressed: NSF NCAR does not perform weather forecasting. It advances the fundamental physical science underpinning large-scale meteorology, space weather, hydrometeorology, and Earth system modeling. Operational forecasting is the role of NOAA. NCAR provides the research engine that improves those operational systems. Its strength derives from the 129-university UCAR consortium — universities generate the science; NCAR integrates, scales, and enables it nationally.

For more than six decades, NSF NCAR has served the national interest through its structure as a university-governed FFRDC under NSF stewardship, ensuring scientific independence, cost efficiency, continuity of expertise, and responsiveness to emerging national needs. Transferring stewardship to a non-NSF federal agency with a regulatory or operational mandate (e.g., NOAA, DOE, or NASA) would fundamentally alter its role as a neutral research platform. Management by a private for-profit organization would be equally inconsistent with its public mission.

National Security Implications in the Arctic

At UAF, in collaboration with NSF NCAR laboratories (CGD, RAL, HAO, EOL, MMM, ACOM and EdEC), we conduct physical science research that directly serves the Department of Defense (DoD) and Department of Homeland Security (DHS). Reductions or fragmentation of NSF NCAR capabilities would significantly weaken U.S. Arctic readiness in the following areas:

1. **Sea-Ice Prediction (Strategic Maritime Navigation):** Sea-ice prediction is a strategic asset for Arctic Ocean navigation and trans-Arctic shipping. Collaborations with NSF NCAR's CGD lab support polar modeling critical for commercial navigation and strategic Arctic access.
2. **Magnetic Substorms and Space Weather:** Magnetic substorms directly affect nuclear submarine communications and high-latitude infrastructure — the reason the UAF Geophysical Institute was founded in 1948. Collaboration with NSF NCAR's HAO is essential for defense communications resilience.
3. **Permafrost and Arctic Infrastructure:** Permafrost dynamics govern heavy equipment deployment, infrastructure stability, and operational logistics. These processes are not yet

fully integrated into Earth system models, and continued NSF NCAR collaboration is essential to close that gap.

4. **Fort Greely Rapid Refresh Modeling:** NSF NCAR RAL provides specialized weather and Earth-system modeling supporting military operations at Fort Greely, which hosts the nation's anti-ballistic missile defense systems. This is not commercial forecasting — it is mission-critical environmental physics.
5. **Coastal Relocation and River Ice:** NSF NCAR RAL's scenario modeling supports planned relocation of vulnerable Arctic coastal communities and forecasting of river ice breakup — events that can generate catastrophic flooding affecting defense installations and northern logistics corridors.
6. **Research Capacity in the Arctic:** Alaska participates in the NSF-EPSCOR and NASA-EPSCOR programs that advance research capability in the Arctic. Collaboration with NCAR enhances those efforts by supporting projects and programs that are building research capacity under EPSCOR.

If Adjustments Are Required

UAF recognizes that NSF may be operating under Executive directives requiring restructuring. If adjustments are necessary, they must:

- Preserve the integrated scientific architecture of observational, modeling, and computational capabilities.
- Maintain university governance and broad community access.
- Protect continuity of long-term datasets and modeling systems.
- Avoid mission drift toward operational forecasting mandates that belong to other agencies.

Reform should focus on improving coordination, performance metrics, and cost transparency — not dismembering the scientific ecosystem that enables U.S. leadership in Earth system science. NCAR capabilities do not duplicate those of other agencies; they complement them. Research at DOE, NOAA, and NASA all benefit from the research conducted at NCAR. Eliminating or fragmenting NCAR would increase duplication elsewhere, not reduce it.

Conclusion

Restructuring beyond targeted efficiency improvements would significantly weaken U.S. scientific leadership, Arctic readiness, and national security capabilities. NOAA's stated ambition to surpass ECMWF in medium-range forecasting requires strengthening — not fragmenting — the research ecosystem that fuels physical model innovation. NSF NCAR, under NSF stewardship and university governance through UCAR, remains central to that ecosystem and to the security of the United States in the Arctic.