

NATIONAL CENTER FOR ATMOSPHERIC RESEARCH (NCAR)

<https://ncar.ucar.edu/>

National Center for Atmospheric Research Funding

(Dollars in Millions)

	FY 2023		Change over	
FY 2022	Estimate	FY 2024	FY 2023 Estimate Base	
Actual	Base	Request	Amount	Percent
\$104.64	\$116.20	\$134.41	\$18.21	15.7%

Brief Description

The National Center for Atmospheric Research is an NSF-sponsored Federally Funded Research and Development Center guided by the vision: “a world-class research center leading, promoting and facilitating innovation in the atmospheric and related Earth Systems sciences.” NCAR’s expert staff of research scientists, engineers, education and outreach specialists, and support personnel collaborates closely with colleagues in the academic community to improve understanding and prediction of the sun-Earth system, including the human dimensions. This work is crucial to improving the Nation’s ability to navigate the challenges presented by our rapidly changing climate.

NCAR’s primary locations are the Mesa Laboratory in Boulder, Colorado (CO), the Research Aviation Facility (RAF) in nearby Broomfield, CO, the NCAR-Wyoming (WY) Supercomputing Center (NWSC) in Cheyenne, WY, and the Mauna Loa Solar Observatory in Hawaii (HI).

Meeting Scientific Community Needs

NCAR’s mission is to understand the behavior of the atmosphere and related Earth and geospace systems; to support, enhance, and extend the capabilities of the university and broader scientific communities, nationally and internationally; and to foster the transfer of knowledge and technology for the betterment of life on Earth. NCAR fulfills this mission with highly integrated research and facilities organized around three overlapping primary areas of activity: cutting edge airborne and ground-based observational facilities; community weather and climate models with many thousands of users worldwide; and petascale high-performance computing. Cross-cutting programs promote education, career development, public engagement, and increased diversity for the entire geosciences community. NCAR maintains an extensive range of partnerships throughout the academic, private, and government sectors.

NCAR’s programs are guided by the 2020 – 2024 NCAR Strategic Plan, which was developed with broad community input and emphasizes three overlapping priorities: 1) enhancing and building on NCAR’s core strengths in fundamental research in the atmospheric and related sciences; 2) promoting integrated Earth System Science; and 3) advancing actionable science, to help address society’s most pressing environmental challenges.

Status of the Facility

NCAR is operated for NSF by the University Corporation for Atmospheric Research (UCAR), a

consortium of 122 member universities in the U.S. and overseas. Several significant infrastructure improvement projects have recently been completed, including a full overhaul of the primary heating and cooling systems at the Mesa Laboratory that will result in considerable increases in efficiency and reduced operating costs. A major renovation of the RAF at the Rocky Mountain Metropolitan Airport has provided new, state-of-the-art laboratory, engineering, and technical space in support of the two NSF-owned, NCAR-operated research aircraft and the community of scientists and engineers that use them. The propellers on the NCAR C-130 aircraft were recently upgraded to improve range and efficiency.

The completion of a major upgrade to the NWSC in 2023 will result in a more than threefold increase in the computing speeds available to users in the Earth System Science research community, together with enhanced capabilities for supporting applications in machine learning and artificial intelligence. The new system is called 'Derecho' following a statewide naming competition among Wyoming school students.

NCAR's Mauna Loa Solar Observatory, in HI, has been closed since November 2022, following a nearby volcanic eruption. NCAR is working with the National Oceanographic and Atmospheric Administration, the site's owner, on a schedule for resuming operations as conditions allow.

Governance Structure and Partnerships

NSF Governance Structure

NSF oversight is provided by program officers in GEO's Division of Atmospheric and Geospace Sciences who work cooperatively with staff from other GEO divisions, the Office of Budget, Finance, and Award Management (BFA), the Office of the General Counsel, and the Office of Legislative and Public Affairs. Within BFA, the Large Facilities Office provides advice to program staff and assists with agency oversight and assurance. The GEO facilities team and the Chief Officer for Research Facilities also provide high-level guidance, support, and oversight.

External Governance Structure

UCAR engages NCAR's stakeholders in its governance, strategic planning, and program implementation through mechanisms such as a dedicated subcommittee of the UCAR Board of Trustees; standing external advisory committees for each NCAR laboratory, the NCAR Director and certain targeted initiatives; panels for allocating computing and observing resources; and governance bodies for the community models. Other sources of input include community workshops, *ad hoc* working groups, and studies by the National Academies of Sciences, Engineering, and Medicine.

Partnerships and Other Funding Sources

NCAR leverages its NSF funding with significant support from other sources. Other federal agencies typically provide approximately 25 percent of NCAR's total annual budget. A further 8-10 percent comes from state and local governments, universities, industry, and non-profits. This funding, which must directly support NCAR's NSF-funded program, extends NCAR's fundamental research into a wide variety of applications such as wildfire management, road and aviation safety, public health, and renewable power generation.

Major Facilities

Funding

Total Obligations for NCAR

(Dollars in Millions)

	FY 2022 Actual	FY 2023	FY 2024 Request	ESTIMATES ¹				
		Estimate Base		FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Operations & Maintenance	\$104.64	\$116.20	\$121.00	\$121.00	\$121.00	\$121.00	\$121.00	\$121.00
Deferred Maintenance	-	-	13.41	-	-	-	-	-
TOTAL	\$104.64	\$116.20	\$134.41	\$121.00	\$121.00	\$121.00	\$121.00	\$121.00

¹ Outyear estimates are for planning purposes only. The current cooperative agreement ends in September 2023.

NSF's FY 2024 Request for NCAR provides for recurring infrastructure costs including periodic technology refreshes of the NCAR supercomputers, scheduled aircraft maintenance, and upgrades to the NCAR buildings. Additional one-time NSF funding (\$13.41 million) will be provided for projects that improve NCAR's ability to carry out its mission as well as increase the energy efficiency and resilience of the infrastructure, such as replacing deteriorating original building systems from the 1960s.

Reviews and Reports

NSF conducts a comprehensive review of NCAR's science programs, facilities, and management at the mid-point of each five-year award. The 2021 review comprised site visits by four teams of external experts assessing: (1) Observing Science and Facilities; (2) Computation and Data Science and Facilities; (3) Community Modeling and Data Assimilation and (4) Management. The first three visits occurred between May and June 2021, and the fourth was held in August 2021. Findings from the reviews have been incorporated into NCAR's program plans. A Business Systems Review was conducted in summer 2022.

Renewal/Recompetition/Disposition

The current five-year award to manage and operate NCAR was made to UCAR, beginning October 1, 2018. This award may be extended for an additional five-year term, subject to adequate awardee performance, NSF review of a renewal proposal and NSB authorization of an award. NSF's review of awardee performance took place in 2021, as described previously. Remaining steps in the process are currently underway.