United States Government Accountability Office

Report to Congressional Committees

February 2026

NATIONAL SCIENCE FOUNDATION

Schedule Delays Continue for Some Major and Midscale Research Infrastructure Projects

GAO-26-107842

GAO Highlights

NATIONAL SCIENCE FOUNDATION

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GAO-26-107842 February 2026

A report to congressional committees.

For more information, contact Hilary Benedict at benedicth@gao.gov.

What GAO Found

The National Science Foundation (NSF) has 21 research infrastructure projects funded through its Major Research Equipment and Facilities Construction (MREFC) and Research and Related Activities accounts, as of July 2025. This includes 13 major projects ($100 million or more) and eight midscale projects ($20 million to $100 million) at various stages of design, construction, and implementation.

While all of these research infrastructure projects remained within their NSF-authorized total cost since GAO's June 2024 report, several have experienced schedule delays or scope changes. Specifically, as of July 2025, four of the seven major projects in construction reported delays of 4 to 27 months relative to schedules GAO reported in June 2024 (see table below). NSF attributed delays to numerous factors, such as labor shortages, contractor underperformance, and budgetary uncertainty. Further, NSF reported reductions in scope for two of these projects, as well as three of eight midscale projects.

Status of NSF's Major Research Infrastructure Projects Under Construction, as of July 2025

Project	Authorized cost	Estimated completion	Scope reduction
Antarctic Infrastructure Recapitalization Program	$155.4 million	August 2029	-
Vera C. Rubin Observatory	$571 million	January 2026 ▲ 10 months	-
Antarctic Infrastructure Modernization for Science	$410.4 million	May 2027 ▲ 4 months	✓
Regional Class Research Vessels	$400 million	April 2029 ▲ 27 months	✓
Large Hadron Collider High Luminosity Upgrade Program			
ATLAS Detector	$82.8 million	December 2028 ▲ 5 months	-
CMS Detector	$88 million	June 2028 ▼ 1 month	-
Leadership-Class Computing Facility	$457.4 million	March 2028	-
Total	**$2,165 million**		

Legend: ATLAS = A Toroidal Large Hadron Collider Apparatus; CMS = Compact Muon Solenoid; ▲ = increase since June 2024; ▼ = decrease since June 2024; ✓ = scope reduced since June 2024.

Source: GAO analysis of National Science Foundation (NSF) information. | GAO-26-107842

NSF considers several factors when selecting and awarding new research infrastructure projects. Specifically, NSF examines the scale and maturity of the proposed project, the availability and stability of annual appropriations, and external economic conditions. NSF has two separate processes for selecting major and midscale projects. Major facilities undergo an extensive, multiphase review and selection process, including consultation with the National Science Board. Midscale projects undergo a merit review and selection process led by NSF.

Why GAO Did This Study

Modern and effective research infrastructure, including facilities and equipment, is critical to maintaining U.S. global leadership in science and engineering. NSF provides funding for the design, construction, and operations of this infrastructure. This infrastructure spans a wide range of projects, from oceanographic research vessels to telescopes and supercomputers.

The Consolidated Appropriations Act, 2024 includes a provision for GAO to review projects funded from NSF's MREFC account.

This is the eighth report in this series and builds on GAO's previous work. This report describes (1) the cost and schedule performance for NSF's major and midscale projects funded through the MREFC account and (2) NSF's process for selecting which projects receive MREFC funding and the key factors that contribute to NSF's ability to select new projects.

GAO examined NSF policies and documents for projects that were in design, construction, and implementation and interviewed agency officials.

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Abbreviations

AIMS	Antarctic Infrastructure Modernization for Science
AIR	Antarctic Infrastructure Recapitalization
ATLAS	A Toroidal Large Hadron Collider Apparatus
CMS	Compact Muon Solenoid
FY	fiscal year
LCCF	Leadership-Class Computing Facility
LEGEND-1000	Large Enriched Germanium Experiment for Neutrino-less Double-beta Decay
MREFC	Major Research Equipment and Facilities Construction
NSB	National Science Board
NSF	U.S. National Science Foundation
OMB	Office of Management and Budget
US-ELT	U.S. Extremely Large Telescope
VEOC	Vehicle Equipment and Operations Center

U.S. GOVERNMENT ACCOUNTABILITY OFFICE
441 G St. N.W.
Washington, DC 20548

February 24, 2026

The Honorable Jerry Moran
Chair
The Honorable Chris Van Hollen
Ranking Member
Subcommittee on Commerce, Justice, Science, and Related Agencies
Committee on Appropriations
United States Senate

The Honorable Hal Rogers
Chairman
The Honorable Grace Meng
Ranking Member
Subcommittee on Commerce, Justice, Science, and Related Agencies
Committee on Appropriations
House of Representatives

Modern and effective research infrastructure is critical to maintaining U.S. global leadership in science and engineering. The U.S. National Science Foundation (NSF) supports the design, construction, and operations of various research infrastructure projects, such as ground-based telescopes and oceanographic research ships that have complex, multiyear construction plans.[1] These projects are generally funded by NSF's Major Research Equipment and Facilities Construction (MREFC) account and fall into one of two categories: major projects and midscale projects. Major projects have construction costs of at least $100 million, while midscale projects include research infrastructure with costs between $20 million and $100 million (referred to as "Track-2" projects).[2]

[1]NSF defines research infrastructure as any combination of facilities, equipment, instrumentation, computational hardware and software, and the necessary supporting human capital. See National Science Foundation, *Research Infrastructure Guide*, NSF 25-200 (September 2025).

[2]NSF also undertakes midscale projects with award amounts between $4 million and $20 million (referred to as "Track-1" projects). NSF funds the Track-1 midscale projects using its Research and Related Activities account, which is outside the scope of our review.

The Consolidated Appropriations Act, 2024 includes a provision for GAO to review projects within NSF's MREFC account.[3] This report is the eighth in the series and builds on our previous work.[4] It describes (1) cost and schedule performance updates for major and midscale projects funded through the MREFC account and (2) NSF's process for selecting the projects that receive MREFC funding and the key factors that contribute to NSF's ability to select new projects.

To address our research objectives, we analyzed NSF cost and schedule documentation, such as agency and project status reports, to obtain updates on each of the 21 projects in our scope. To collect the most up-to-date information, we supplemented progress report data with a questionnaire to NSF to obtain updated project status, cost, and schedule information as of July 2025. In addition, we conducted interviews with NSF officials about major projects in design or construction and midscale projects in implementation at the time of our review.[5] We collected and reviewed NSF policies, procedures, and guidance related to major and midscale project selection, as well as MREFC budget data to determine the key factors that contribute to NSF's ability to select new projects. For a detailed description of our scope and methodology, see appendix I.

We conducted this performance audit from September 2024 to February 2026 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

[3]The provision is contained within the explanatory statement printed at 170. Cong. Rec. S1398 that accompanied the Consolidated Appropriations Act, 2024, Pub. L. No. 118-42, 138 Stat. 25.

[4]Our prior report on this issue is GAO, *National Science Foundation: Five Major Facilities Projects Experienced Delays*, GAO-24-107044 (Washington, D.C.: June 12, 2024).

[5]According to NSF officials, midscale research infrastructure projects are described as being in the "implementation" stage rather than in "construction" given their wide range in technical nature.

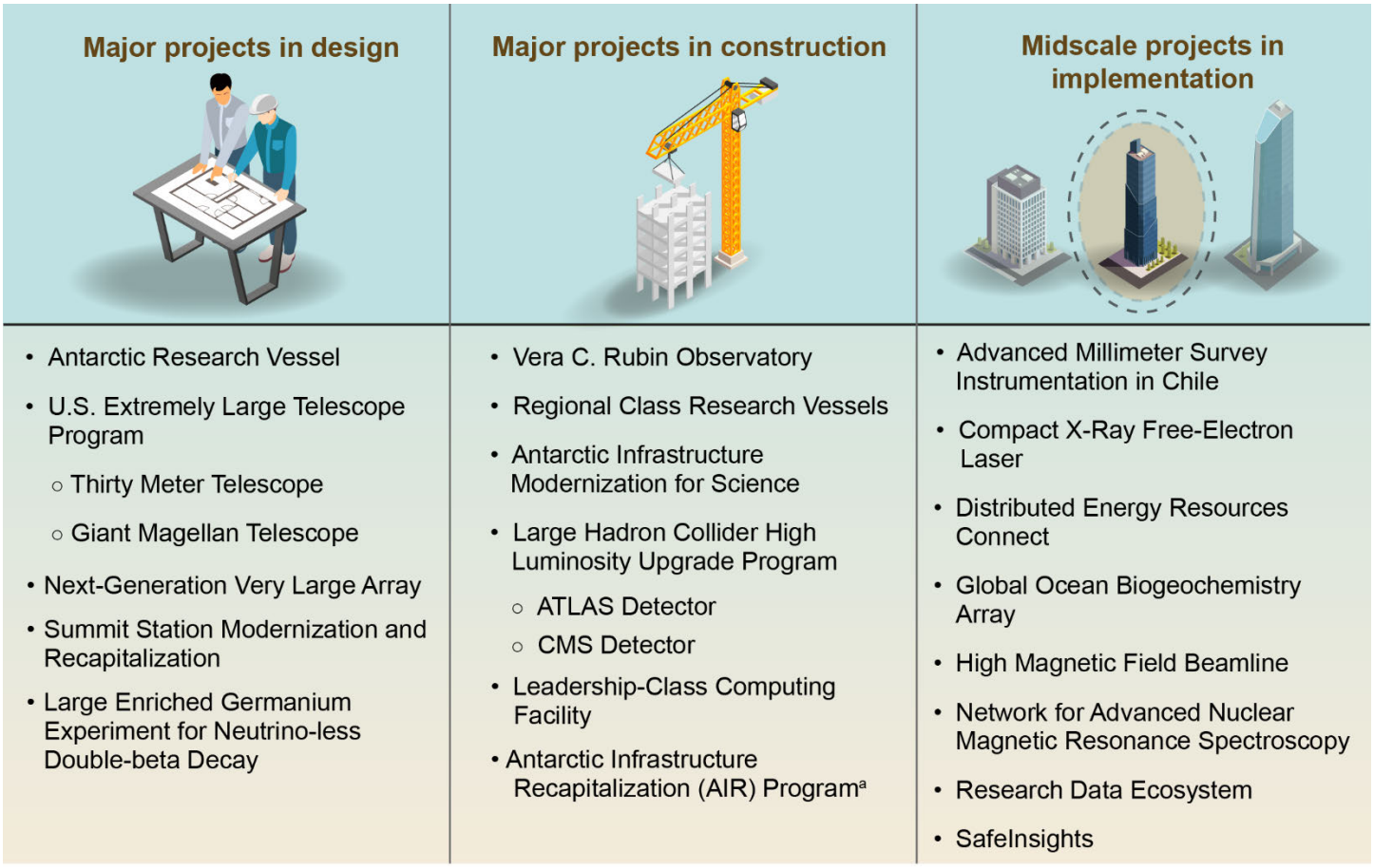
Background

NSF Research Infrastructure Construction Projects and Life Cycle

As of July 2025, NSF had 21 research infrastructure projects in design, construction, or implementation that were either funded or may be proposed for funding from the MREFC account (see fig. 1). Of these 21 projects, six were major projects in the design stage, seven were major projects in the construction stage, and eight were midscale projects in implementation.[6]

[6]The Antarctic Infrastructure Recapitalization (AIR) program is a series of investments in facilities and infrastructure in Antarctica with costs between $740,000 and $100 million. For the purposes of this report, we include the AIR program as a major project since the total program cost is greater than $100 million and all projects are intended to support continued U.S. scientific leadership in Antarctica.

Figure 1: NSF's Major and Midscale Research Infrastructure Projects, as of July 2025



Legend: ATLAS = A Toroidal Large Hadron Collider Apparatus; CMS = Compact Muon Solenoid

Source: GAO analysis of National Science Foundation (NSF) information; Macrovector/adobestock.com. | GAO-26-107842

[a]The AIR program is a portfolio of investments in facilities and infrastructure in Antarctica with a combined total project cost of over $100 million.

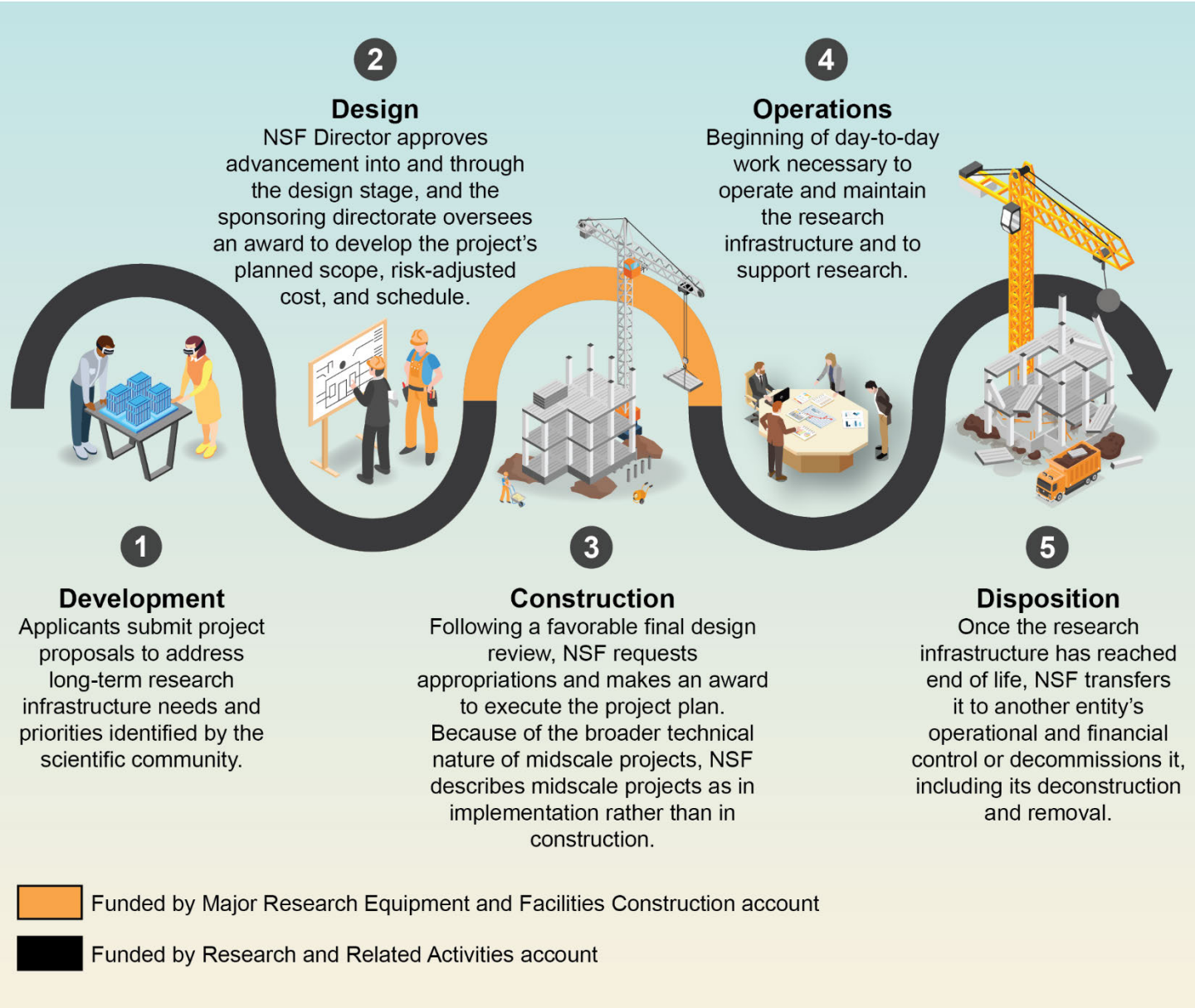
NSF uses cooperative agreements and contracts to fund and oversee research infrastructure projects throughout their life cycles, including the design, construction (implementation), and operations stages. Research infrastructure projects are sponsored by one of NSF's eight research directorates, each of which comprises specialized divisions within its

focus area.[7] For major projects, the responsible division within the sponsoring research directorate assesses the scientific merit of a potential project; proposes a project for funding through the agency's MREFC account; and, in conjunction with other members of the agency's integrated project team, is responsible for overseeing the project during the five stages of its life cycle (see fig. 2).[8]

[7]NSF is divided into the following eight research directorates that support science and engineering research and education: (1) biological sciences; (2) computer and information science and engineering; (3) engineering; (4) geosciences; (5) mathematical and physical sciences; (6) social, behavioral, and economic sciences; (7) science, technology, engineering, and mathematics education; and (8) technology, innovation, and partnerships.

[8]According to NSF's *Research Infrastructure Guide*, the agency's integrated project team is formed when a major project enters the design stage and primarily includes the program officer, awarding official, and Research Infrastructure Office liaison. The integrated project team is distinct from the awardee's project team, which is responsible for executing the work. An awardee's project team comprises key personnel—such as the principal investigator, project director, or project manager—and any additional staff who, collectively with the key personnel, possess competencies within all 15 NSF-defined program management standards and principles. Examples of those standards and principles include strategic planning and financial and risk management. See NSF 25-200.

Figure 2: The Five Stages of an NSF Research Infrastructure Project's Life Cycle



Source: GAO analysis of National Science Foundation (NSF) information; Macrovector/adobestock.com. | GAO-26-107842

According to NSF's *Research Infrastructure Guide*, a project's progression through the design stage generally occurs in three phases—conceptual design, preliminary design, and final design—each with its own associated project milestones.[9] Each design phase includes an external panel review of a project's completion of these milestones, with an optional interim review at NSF's discretion based on a project's progress. In some cases, a proposed project can enter the design stage at a later phase based on its technical readiness for advancement coming out of the development stage. After an internal NSF facilities readiness panel reviews the project at the end of the final design phase, the NSF Director may approve a project for construction in the agency's annual budget request and recommend the National Science Board (NSB) authorize an award.[10] Moving into the final design phase does not guarantee that a project will be approved for construction, and doing so does not obligate the agency to provide any further funding.

The NSF Office of the Director and NSB provide high-level, ongoing oversight of research infrastructure projects throughout their life cycle. The NSF Office of the Director can place research infrastructure projects on its Watch List—an internal management tool used to provide additional oversight and resources—when a project encounters critical issues. According to NSF officials, Watch List designation is not punitive; it is intended to mobilize expertise and support to address risks and keep the project on track. As of July 2025, the Watch List included the Antarctic Infrastructure Modernization for Science (AIMS) and Regional Class Research Vessels projects.

[9]NSF 25-200.

[10]As of April 2025, NSF's Chief of Staff was performing the duties of the NSF Director. The NSB advises on strategic-level agency policy for MREFC-funded research infrastructure, including the review of NSF's budget requests and construction stage awards for major projects.

Appropriations for NSF Major Research Equipment and Facilities Construction

In fiscal years (FY) 2020 through 2024, NSF received over $1 billion in appropriations for its MREFC account, as shown in table 1.

Table 1: Appropriations for NSF Major Research Equipment and Facilities Construction, Fiscal Years 2020 through 2024 (dollars in millions)

	Fiscal year				
	2020	**2021**	**2022**	**2023**	**2024**
Appropriations	$243.2	$301.0	$265.5	$187.2	$234.0

Source: National Science Foundation (NSF) information. | GAO-26-107842

Note: Appropriations as shown are after supplemental appropriations, transfers, and reprogramming. Appropriations amounts are rounded to the nearest $100,000.

Under a bipartisan agreement, Congress began funding NSF's MREFC account in FY 2023 using an emergency appropriations designation. The authority for Congress to designate certain appropriations as emergency requirements, which exempts them from statutory discretionary spending limits, stems from the Balanced Budget and Emergency Deficit Control Act of 1985, as amended. This act permits Congress to appropriate funds beyond established caps if such appropriations are explicitly designated as emergency requirements in legislation and subsequently designated as such by the President. Congress funded NSF's MREFC account using this emergency appropriations designation again in FY 2024 and in the Full-Year Continuing Appropriations and Extensions Act, 2025. However, after enactment of the FY 2025 appropriations, the administration withdrew the emergency designation status of these funds, effectively making them unavailable to NSF.

NSF officials submitted a request in May 2025 to the Office of Management and Budget (OMB) to address this shortfall by reprogramming carryover funds within the MREFC account from prior years and transferring funds from other accounts. OMB approved the request in June 2025.

Construction Cost and Schedule of Major Research Infrastructure Projects

Under NSF's major facilities construction process, the recipients of design awards develop construction cost and schedule estimates for projects and submit them to NSF for review. After a project's final design review, NSF authorizes a not-to-exceed total project cost and duration. The authorized not-to-exceed amount acts as a ceiling for the award and is the amount against which NSF assesses potential cost increases to major projects.

Since February 2008, NSF has had a “No Cost Overrun” policy to manage cost increases on these projects. Under this policy, the cost estimate developed at the preliminary design review is expected to include adequate budget contingency to cover all foreseeable risks. NSF will only request an increase above the not-to-exceed total project cost—thus re-baselining the project—if the realized risks cannot be best addressed with budget contingency, reductions in scope, or acceptable replanning options. Reductions in scope differ from replanning actions on a project. NSF defines replanning as a normal project management process to modify or reorganize the performance measurement baseline cost or schedule plans for future work without affecting total project cost, project end date, or overall scope objectives or the implementation of approved de-scoping options.

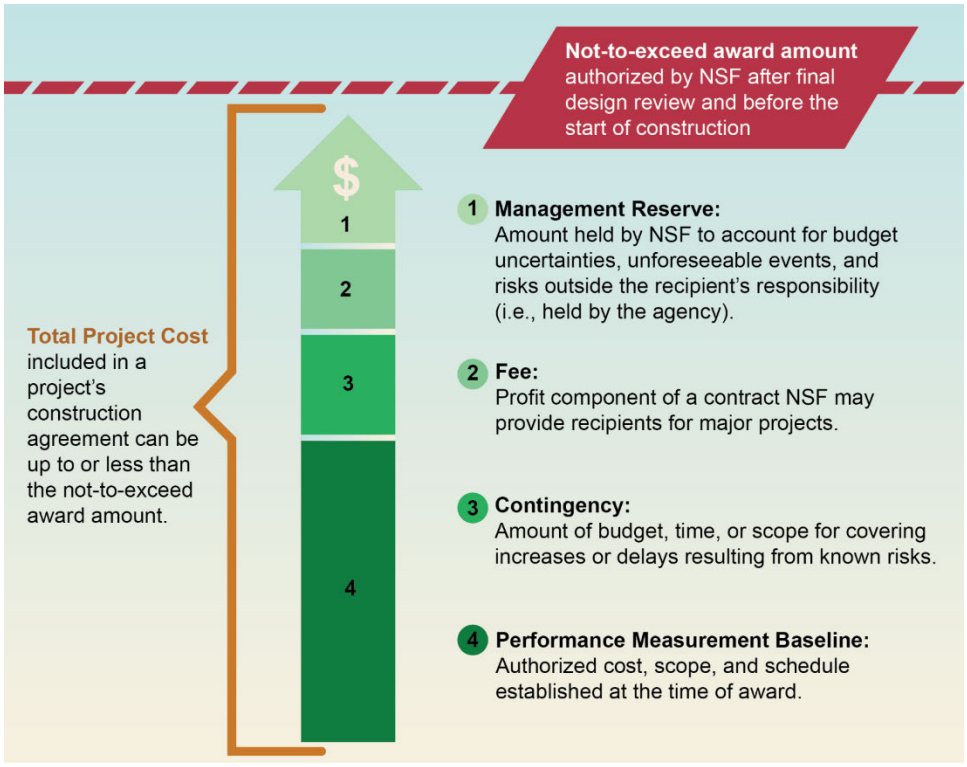
According to NSF’s *Research Infrastructure Guide*, a project’s baseline is the approved cost and schedule plan for a scope of work, used during planning.[11] For NSF, contingency funding is not included in the baseline but is held and managed separately. Once an initial baseline has been approved, it can no longer be changed without a formal review process. The baseline is used as the basis for monitoring progress against the plan, which is referred to as the performance measurement baseline.

Figure 3 shows the components that make up the total project cost for the construction of research infrastructure projects, as defined in NSF’s *Research Infrastructure Guide*.[12]

[11]NSF 25-200.

[12]NSF 25-200.

Figure 3: Components of a Research Infrastructure Project's Not-to-Exceed Total Project Cost



Source: GAO analysis of National Science Foundation (NSF) information. | GAO-26-107842

The NSB has the authority to approve the use of management reserve funds but has currently delegated that authority to the NSF Director for increases to the total award amount up to the lesser of $10 million or 20 percent of the award. Management reserve funds may come from reprogramming of funds within the MREFC account, transfer of funds to the MREFC account, or additional appropriations from Congress. After authorizing the use of management reserve funds, NSF does not disburse funding to the recipient until NSF has verified the specific needs to be addressed.

Projects in Design or Construction Progressed Despite Continued Schedule Delays and Other Management Challenges

NSF continues to make progress with its major projects in design or construction, as well as midscale projects funded from the MREFC account. No projects received increases to their NSF-authorized total cost since our June 2024 report.[13] However, four of the seven major projects in construction have reported schedule delays of 4 to 27 months compared to the estimates in our June 2024 report. In addition, NSF further reduced the original scope of the AIMS project from two of the six original buildings to one. One major project previously in design—the Leadership-Class Computing Facility (LCCF)—progressed to construction, while two additional major projects entered the design stage. Since our June 2024 report, NSF has made progress in implementing eight of the nine previously awarded midscale projects, including one new project in implementation as of July 2025, and terminated one midscale project. Appendixes II through IV provide overviews for the major and midscale projects in construction, design, or implementation.

Major Projects Progressed Within Authorized Costs but Face Delays or Scope Reductions

All Major Projects Remained Within Authorized Costs, but NSF Has Further Reduced the Scope of One Project

All the major projects remained within their NSF-authorized total cost since our June 2024 report.[14] However, NSF further reduced the original scope of the AIMS project from two of the six original buildings to one.[15]

In May 2024, NSF issued a notice to the award recipient to discontinue construction of the Vehicle Equipment and Operations Center (VEOC). According to NSF officials, NSF decided to halt completion of the VEOC due to its concerns with the award recipient's performance and determination that it would not be able to complete the project under the terms of the existing contract. Specifically, numerous issues affected the

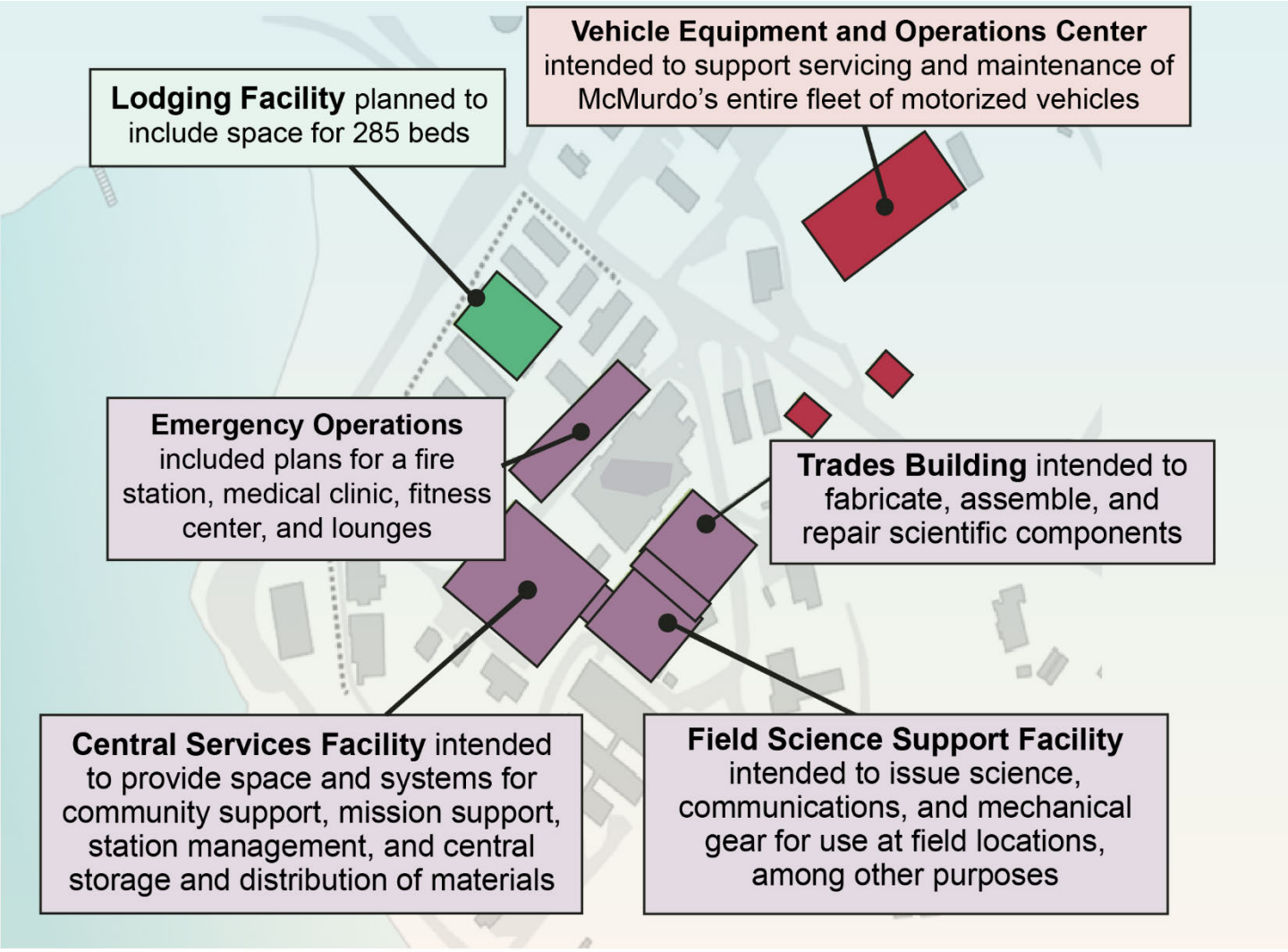
[13]GAO-24-107044.

[14]GAO-24-107044.

[15]We previously found that NSF de-scoped four of the project's buildings in June 2022 in response to untenable cost increases resulting from the COVID-19 pandemic and other complexities associated with the logistics of construction activities in Antarctica. At the time of the first de-scoping decision in June 2022, construction on the four buildings removed from the project scope had not yet begun. See GAO, *National Science Foundation: Continued Cost and Schedule Increases for Major Facilities Projects in Construction*, GAO-22-105550 (Washington, D.C.: July 20, 2022).

schedule, including the foundation being placed incorrectly, design quality issues, staffing shortages, lingering effects of the COVID-19 pandemic, delays obtaining work clearances for New Zealand staff, and late delivery of a crane. At the time of the stop work order, construction of the VEOC's foundation had not yet been completed. The lodging facility remains part of the project's scope (see fig. 4).

Figure 4: The Original Six Buildings of NSF's Antarctic Infrastructure Modernization for Science Project



Source: GAO analysis of National Science Foundation (NSF) information. | GAO-26-107842

NSF plans to continue construction of the VEOC, as well as other de-scoped buildings of the AIMS project, under the Antarctic Infrastructure Recapitalization (AIR) program. According to the agency's FY 2026 budget request, the AIR program is expected to provide a long-term funding source for the infrastructure investments necessary to ensure

safety, enhance efficiency and sustainability, increase resilience, and facilitate the U.S. Antarctic Program's continued scientific leadership on the continent. As of July 2025, NSF was evaluating whether to include de-scoped components of the original AIMS project in the AIR program based on their priority relative to other recapitalization needs across Antarctica.

NSF is prioritizing completion of the lodging facility due to the critical role it is expected to have in supporting scientific operations at McMurdo Station. The lodging facility experienced delays during the 2024 construction season, but in January 2025 the exterior shell of the building was substantially completed, which allowed for work to continue during the winter season within the enclosure.

In December 2023, we recommended that the Director of NSF ensure that the AIMS project's cost estimate met the characteristic of being well-documented, as defined in GAO's cost guide.[16] We made this recommendation after finding that, although NSF's documentation provided details on how costs were calculated, they did not include sufficient information on the methods and data used to generate labor and material quantity estimates from the technical specifications of the project. NSF concurred with the recommendation, stating that it would develop a corrective action plan that will include appropriate measures for revised cost proposals for the project. In October 2024, NSF officials provided us with the new cost to complete facility components, along with supporting documentation, which we determined met the criteria outlined in our cost estimation best practices for being "well-documented," thereby addressing the recommendation.

Most Major Projects in Construction Faced Continued Schedule Delays

According to our review of NSF's project management data, four of the seven major projects in construction experienced schedule extensions relative to their June 2024 estimates. Specifically, one Large Hadron Collider High Luminosity detector upgrade and the Vera C. Rubin Observatory, Regional Class Research Vessels, and AIMS projects experienced additional delays. Since our June 2024 report, the LCCF project transitioned from design to construction. Table 2 shows the NSF-reported status of each major project in construction, as of July 2025.

[16]GAO, *National Science Foundation: Additional Steps Would Improve Cost Estimate for Antarctic Research Infrastructure Project*, GAO-24-106380 (Washington, D.C.: Dec. 5, 2023).

Table 2. Performance of NSF's Major Projects under Construction, as of July 2025

Project name	NSF-authorized total project cost[a]	Cost change since June 2024	Expected construction completion date[b]	Schedule change since June 2024	Percentage complete
Antarctic Infrastructure Recapitalization Program[c]	$155.4 million	N/A	August 2029	N/A	N/A
Vera C. Rubin Observatory	$571 million	No change	January 2026	▲ 10 months	98
Antarctic Infrastructure Modernization for Science[d]	$410.4 million	N/A	May 2027	▲ 4 months	80
Regional Class Research Vessels	$400 million	No change	April 2029	▲ 27 months	73
Large Hadron Collider High Luminosity Upgrade Program					
ATLAS Detector	$82.8 million	No change	December 2028	▲ 5 months	59
CMS Detector	$88 million	No change	June 2028	▼ 1 month	56
Leadership-Class Computing Facility[e]	$457.4 million	N/A	March 2028	N/A	27
Total	**$2,165 million**				

Legend: ATLAS = A Toroidal Large Hadron Collider Apparatus; CMS = Compact Muon Solenoid; ▲ = increase; ▼ = decrease

Source: GAO analysis of National Science Foundation (NSF) information. | GAO-26-107842

[a]Total project cost is determined by the NSF authorized not-to-exceed cost. This value is not the same as the current estimated total project cost based on NSF's Earned Value Management System calculations. The total project cost does not include design costs, which do not come from the Major Research Equipment and Facilities Construction (MREFC) account.

[b]Expected construction completion is determined by adding the remaining schedule contingency, if applicable, to the current forecasted construction completion date based on NSF Earned Value Management System calculations where available in comparison to the performance measurement baseline.

[c]The Antarctic Infrastructure Recapitalization (AIR) program comprises a portfolio of midscale Antarctic infrastructure projects, which if combined could be considered a major project. The AIR program is expected to absorb de-scoped work from the Antarctic Infrastructure Modernization for Science (AIMS) project, such as the vehicle equipment and operations center. We determined that the AIR program is in construction but do not provide a completion percentage as several of the projects are at different points in construction. Not all projects within the AIR program use Earned Value Management System calculations, which are not required for midscale research infrastructure projects.

[d]As of July 2025, NSF had not yet implemented changes to the AIMS project's cost to reflect that five of the six components of the AIMS project will no longer be constructed through this project.

[e]The Leadership-Class Computing Facility project transitioned from design to construction after publication of our previous July 2024 report on the performance of NSF's MREFC-funded research infrastructure projects.

The Vera C. Rubin Observatory was formally transferred from the construction team to the operations team in October 2025. NSF began conducting construction stage close-out reviews for the project jointly with the Department of Energy in October 2024. Beginning in April 2025, the Rubin Observatory took over a thousand images that were combined to

fully test its image collection, processing, and storage systems. According to NSF officials, the Rubin Observatory had collected sufficient data by July 2025 to verify that it can meet its minimum established performance requirements for short periods of time. In July 2025, the project began assessing the completion of the major scope elements and the operations team's readiness level. NSF officials stated that the final closeout and operational readiness review was conducted in Chile in October 2025. According to NSF officials, a few minor items that do not affect the operational readiness of the telescope are pending completion with an estimated completion date of June 17, 2026, at no additional cost.

Construction of the three ships included in the Regional Class Research Vessels project has progressed behind schedule, and NSF anticipates delays to continue as the project navigates several ongoing challenges. Inadequate shipyard performance remains the project's primary identified risk, which NSF data indicate is the result of factors including labor shortages, limited shipyard space for construction activities, and the overall complexity of electrical power and control systems. For the remaining construction activities, NSF and the project team are monitoring significant risks. NSF expects these risks could increase the project's schedule and require use of its limited remaining budget contingency. To increase the project's remaining budget contingency, NSF has taken planned steps—including saving $2.5 million in March 2025 by acquiring fewer spare propulsion drives than planned—and is evaluating risks to the project while it considers other options.

Ongoing Management Challenges Could Lead to Future Project Cost Increases or Reduced Scope and Schedule Delays

According to NSF officials, project teams are tracking other factors that could result in potential cost increases and schedule delays for their respective projects, including tariffs and supply chain issues. Similar to how NSF responded to the COVID-19 pandemic, NSF officials said these risks would not have been captured in a project's risk register and, therefore, would be addressed using NSF-held management reserve funding or supplemental appropriation requests, rather than a project's allotted budget contingency.[17]

Project teams are analyzing the potential effects of tariffs and supply chain issues; however, they also cited uncertainty about funding as a key challenge that could lead to project delays. Specifically, NSF officials said

[17]A project's risk register is a tracking document or tool that provides a ranked list of identified risks, with risk impact analysis and prioritization, responsibilities, mitigation plans and opportunities of risk reduction, and risk status over time, according to NSF's *Research Infrastructure Guide*. See NSF 25-200.

the agency did not receive the $234 million in funds Congress designated as an emergency requirement in March 2025 for its MREFC account for the remainder of FY 2025.[18] Obligation of those emergency appropriations required a subsequent designation by the President. Eleven of the 27 emergency designations Congress identified, including for NSF's MREFC account, were not included in the subsequent designation, effectively making the funds unavailable to NSF.

According to NSF officials, in June 2025 OMB approved the agency's request to reprogram unobligated prior-year MREFC account balances that remain available for obligation to cover FY 2025 project needs.[19] NSF primarily redirected a portion of its remaining prior-year funding originally intended for the AIMS project—which has been reduced in scope—to the LCCF project that entered construction since our June 2024 report. Table 3 provides a summary of NSF's reprogramming of prior-year MREFC funds for FY 2025.

Table 3. NSF's Reprogramming of Prior-Year Major Research Equipment and Facilities Construction Account Funds for Fiscal Year 2025 (dollars in millions)

Line item	From	To
Antarctic Infrastructure Modernization for Science	$99.75	-
Antarctic Infrastructure Recapitalization Program	-	$36.9
Large Hadron Collider High Luminosity Upgrade Program	-	-
Leadership-Class Computing Facility	-	$69.42
Regional Class Research Vessels	-	$1.02
Vera C. Rubin Observatory	$1.31	-
MREFC-funded midscale portfolio	$2.4	-
Dedicated construction oversight	-	$1.52
Balances from completed projects[a]	$5.41	-
Total	**$108.86**	**$108.86**

Source: National Science Foundation (NSF) information. | GAO-26-107842

[a]Excludes one-time expense amounts related to Regional Class Research Vessels project construction affected by Hurricane Ida, as provided in the Extending Government Funding and Delivering Emergency Assistance Act.

[18]Full-Year Continuing Appropriations and Extensions Act, 2025, Pub. L. No. 119-4, 139 Stat. 9.

[19]Reprogramming is defined as a shifting of funds within an appropriation or fund account for purposes other than those contemplated at the time of appropriation. For additional information, see GAO, *A Glossary of Terms Used in the Federal Budget Process,* GAO-05-734SP (Washington, D.C.: Sept. 1, 2005).

NSF officials said they expected prior-year MREFC funds to cover FY 2025 project needs for the Rubin Observatory, Large Hadron Collider High Luminosity upgrades, and Regional Class Research Vessels projects. However, NSF officials said that the funding uncertainty after the enactment of appropriations had caused delays to major procurements for the new LCCF project. These major procurements have been deferred to FY 2026. As of July 2025, NSF did not expect procurement delays to have significant downstream effects on the LCCF project. However, the LCCF project's estimated risk exposure was increased from $63.4 million to $71.6 million in July 2025 after funding uncertainties and evolving market conditions, among other factors, indicated that the risk of possible schedule delays or cost increases was likely higher than the project's plan projected, according to NSF data.

According to NSF officials, project teams across the MREFC portfolio are considering adjustments to their cost estimates. The LCCF project team also reported that some actions—such as strategically purchasing goods or services now to significantly reduce future risks, especially in the context of fluctuating market conditions—will require additional funding, which is already limited. In accordance with NSF's No Cost Overrun policy, officials are also considering de-scoping options for the Regional Class Research Vessels project to stay within their NSF-authorized not-to-exceed total project cost.[20] Specifically, the project team is considering implementing planned de-scoping actions and has requested NSF-held management reserve funds allotted to the project.

Some Midscale Projects Descoped or Terminated in Response to Budget Constraints

Although none of the MREFC-funded midscale projects in implementation experienced cost increases relative to the estimates in our June 2024 report, one project was terminated and several projects required scope reductions or adjustments as a result of decreased funding available for FY 2025 activities. Table 4 presents the NSF-reported status of each midscale project in implementation, as of July 2025.

[20]Under NSF's No Cost Overrun policy, the cost estimate developed at the preliminary design review should have adequate contingency to cover all foreseeable risks and any cost increases not covered by contingency are generally to be accommodated by reductions in scope before requesting additional funding. After a project's final design review, NSF authorizes a not-to-exceed award amount and duration. The authorized not-to-exceed award amount is the amount against which NSF measures cost increases to implement its No Cost Overrun policy.

Table 4. Performance of NSF's Midscale Projects in Implementation, as of July 2025

Project name	Current total project cost	Cost change since June 2024	Scheduled completion date	Schedule change since June 2024	Percentage complete
Network for Advanced Nuclear Magnetic Resonance Spectroscopy	$39.7 million	No change	September 2025	▲ 3 months	98
Distributed Energy Resource Connect	$42.0 million	No change	October 2025	No change	97
High Magnetic Field Beamline	$32.7 million	No change	December 2025	No change	94
Global Ocean Biogeochemistry Array	$52.9 million	No change	October 2026	▲ 12 months	72
Research Data Ecosystem	$38.4 million	No change	January 2027	No change	70
Advanced Millimeter Survey Instrumentation in Chile	$52.7 million	No change	April 2028	▼ 4 months	47
Compact X-Ray Free Electron Laser	$90.8 million	No change	February 2028	No change	43
SafeInsights	$89.9 million	N/A	April 2029	N/A	17
Total	**$439.1 million**				

Legend: ▲ = increase; ▼ = decrease

Source: GAO analysis of National Science Foundation (NSF) information. | GAO-26-107842

Note: In April 2025, NSF suspended the Airborne Phased Array Radar midscale project previously in implementation. SafeInsights entered implementation after the cutoff period for inclusion in our prior report, thus the change since June 2024 is not applicable.

NSF approved two new MREFC-funded midscale projects for implementation—SafeInsights and the Open Multi-Modal AI Infrastructure to Support Science (OMAI)—in May 2024 and August 2025, respectively. The SafeInsights project is intended to serve as a central hub for facilitating research and data coordination across a range of major digital learning platforms supporting U.S. education in science, technology, engineering, and mathematics. As planned, the project will constitute NSF's largest single investment in national research and development infrastructure for education, enabling educators to better understand how different students in different settings learn best and develop more effective teaching tools and practices. The OMAI project is intended to create a fully open suite of advanced AI models specifically designed to support the U.S. scientific community.

In August 2025, NSF terminated the award for the Airborne Phased Array Radar project. NSF previously suspended the project in April 2025 after a subcontractor significantly increased the estimated project cost. In May 2024, the subcontractor notified the awardee that completion of the originally planned scope of the project would increase costs by

approximately $18 million, which resulted in the awardee issuing a stop work order to the subcontractor while it sought alternate vendors. The project team presented a revised project plan to NSF in March 2025, and NSF determined that the plan did not demonstrate sufficient scientific viability or project feasibility to warrant continuation. This was the first time NSF terminated an ongoing midscale project in implementation.

In response to reduced MREFC funding available for midscale projects in FY 2025, NSF reported implementing a range of de-scoping options across three midscale projects. According to NSF officials, the options were intended to keep the midscale portfolio within budget constraints without affecting any project's scientific capacity. Further, NSF officials expect that scope elements that were removed for two of the projects can be returned if budgetary conditions improve in FY 2026 and FY 2027. De-scoping options NSF considered include postponing deliverables from sub-awardees identified as not critical for delivering functional research infrastructure; reducing or delaying other noncritical items such as travel, community engagement, and training; postponing some major procurements; and reallocating in-house and offsite computing resources.

Projects in Design Continued and NSF Approved Two New Projects

As of July 2025, four of the six major projects in design were progressing through the design phases.

- As of July 2025, the Next-Generation Very Large Array project, which completed its conceptual design review in September 2024, was constructing a prototype antenna in New Mexico. The agency's evaluation of the prototype antenna is expected to help reduce technical and cost risks associated with the project, according to NSF data.
- In May 2025, NSF approved the U.S. Extremely Large Telescope (US-ELT) program's Giant Magellan Telescope project for advancement to the final design phase.
- In February 2025, the new Summit Station Modernization and Recapitalization project completed its preliminary design review. As of July 2025, project planning and early design efforts were led by the incumbent Summit Station operator while NSF explored contracting options for architectural and engineering, project management, and integration services. This project is intended to modernize the

infrastructure at Summit Station in Greenland to better support Arctic research over the coming decades.[21]

- In June 2025, NSF's new Large Enriched Germanium Experiment for Neutrino-less Double-beta Decay (LEGEND-1000) project entered the design stage as a major project after an independent cost estimate indicated that it would likely cost above the $100 million threshold. The LEGEND-1000 project is intended to advance a global effort to answer fundamental questions in physics. Specifically, the project includes plans to search for a rare type of radioactive decay that could help scientists learn more about the nature of neutrinos—a type of particle with extremely low mass. If the decay is found, the project could help explain why scientists have observed that the universe has more matter than antimatter. Information about the project's planned cost and schedule will be available once it progresses in the design stage.

NSF has paused progress on two projects in design as of July 2025. Given the unaffordability of continuing to fund two different multibillion-dollar telescopes, NSF has decided not to advance the US-ELT program's Thirty Meter Telescope project, which will not receive additional funds from NSF but may continue under external funding. In addition, NSF has paused its search for a contractor to manage the construction process for the Antarctic Research Vessel project while it assesses potential funding availability from other agencies and the effects of recent executive orders related to federal procurement and the U.S. shipbuilding industry.

Economic and Project Maturity Factors Affect NSF's Ability to Select and Award New Projects

NSF's process to select and award new research infrastructure projects is shaped by four factors: (1) the scale of each project proposal, (2) the availability and stability of annual appropriations, (3) external economic conditions, and (4) maturity of the proposed project. NSF has strengthened several portfolio-management policies, including issuing a formal No Cost Overrun policy, revising the *Research Infrastructure Guide* to incorporate GAO scheduling best practices and publishing supplemental guidance on COVID-19 pandemic-related cost controls.[22]

[21]Infrastructure modernization efforts include elevating structures above snow drifting and accumulation and incorporating energy efficient and autonomous systems.

[22]NSF 21-417 and NSF 25-200.

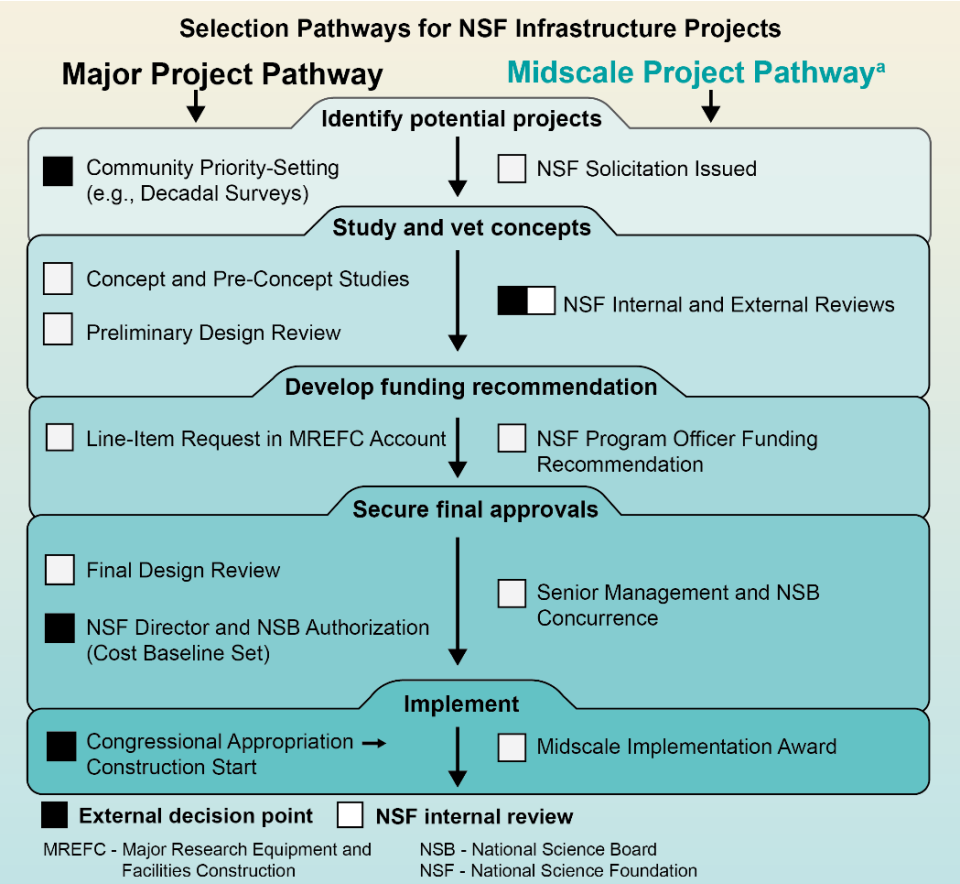
NSF's Major and Midscale Projects Follow Different Selection Processes

NSF applies two distinct pathways for selecting and funding research infrastructure projects. Major projects—large undertakings that exceed $100 million—enter the agency's planning queue after identification of community priorities (often through National Academies Decadal Surveys or similar community consensus studies), multiple design reviews, and review by the NSB.[23] Once a project has cleared these milestones, NSF may request a dedicated line-item appropriation for construction in the MREFC account. This process is intended to ensure rigorous external review and can span a decade from concept to construction.

Midscale projects, by contrast, are generally selected through solicitations and peer review. Successful midscale proposals generally receive initial funding for design from the Research and Related Activities account; only after they enter the implementation phase does NSF consider transferring the project to the MREFC account for funding. Because midscale awards draw on an annual program allocation rather than a project-specific line item, NSF can authorize several such projects concurrently. Selection processes for major and midscale projects are shown in figure 5.

[23]Decadal surveys are consensus-based studies prepared about every 10 years by the National Academies of Sciences, Engineering, and Medicine. Each survey identifies and ranks the science community's highest-priority research questions and the research infrastructure needed to address them. NSF uses the survey results as a key input when deciding which projects to initiate.

Figure 5: Comparison of Major and Midscale Selection Processes



Source: GAO analysis of NSF information. | GAO-26-107842

[a]Midscale projects here refer to Midscale Research Infrastructure Track-2.

Appropriations and Design Maturity Determine the Timing of New Project Starts

Funding availability is the principal driver of when NSF can authorize new research infrastructure projects and initiate construction or implementation. NSF allocates portions of its annual MREFC budget to individual projects such that resources for ongoing projects are protected. For example, in our June 2024 report, we found that in FY 2024, Congress provided $234 million for the MREFC account—an amount that, once existing obligations were met, left no capacity for additional major-project starts.[24]

[24]GAO-24-107044.

Midscale projects face similar funding constraints, governed by both the funds Congress appropriates to the program and NSF's allocation decisions. For example, we previously reported that NSF had reserved $6.5 million from the American Rescue Plan to address COVID-19 pandemic-related cost increases in its ongoing midscale projects, which could have been used for new awards.[25]

Conversely, one-time funding infusions may initially accelerate a project but compress future-year budgets. According to NSF officials, supplemental funding received in FY 2023 allowed NSF to advance one midscale project earlier than planned. However, because that additional project required funding in future years, starting the project earlier reduced funds available for subsequent projects. Thus, NSF officials said that they weigh the immediate benefit of an early start for a project against the longer-term impact on its portfolio when determining when to start a project.

NSF officials said they will only advance projects when both external conditions and internal readiness align. For example, macroeconomic volatility—such as spikes in commodity prices or other critical materials—can inflate project cost estimates, leading NSF to reassess whether a proposal fits within available funding. Delays and cost overruns on existing projects can limit resources available for new projects. For example, supply-chain disruptions and labor shortages may delay projects already in construction, diverting funds that might otherwise be used for new starts.

Project-specific maturity is also an important factor NSF officials use in deciding which projects to move forward to construction. NSF requires that each prospective project demonstrates a clearly defined scope with credible cost and schedule baselines. Projects with unresolved design risks remain in design status until those deficiencies are resolved. For example, NSF has not yet committed to constructing the Antarctic Research Vessel due to interagency coordination on vessel acquisition strategies.

[25]GAO-22-105550.

Agency Comments

We provided a draft of this report to NSF for review and comment. NSF provided technical comments, which we incorporated as appropriate.

We are sending copies of this report to the appropriate congressional committees, the Director of the National Science Foundation, and other interested parties. In addition, the report will be available at no charge on the GAO website at https://www.gao.gov.

If you or your staff have any questions about this report, please contact me at BenedictH@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix V.

//SIGNED//

Hilary M. Benedict
Director
Science, Technology Assessment, and Analytics

Appendix I: Objectives, Scope, and Methodology

The Consolidated Appropriations Act, 2024 includes a provision for GAO to review projects within the U.S. National Science Foundation's (NSF) Major Research Equipment and Facilities Construction (MREFC) account.[1] This report is the eighth in the series and describes: (1) the cost and schedule performance for NSF's major and midscale projects funded through the MREFC account and (2) NSF's process for selecting which projects receive MREFC funding and the key factors that contribute to NSF's ability to select new projects.[2]

To describe the cost and schedule performance of NSF's major research infrastructure projects, we reviewed and analyzed agency project progress reports for project updates dated from July 2024 to July 2025. To describe the status of NSF's midscale research infrastructure projects funded by the MREFC account, we also reviewed an agency dashboard that detailed project cost and schedule and recent project milestones that were updated as of July 2025. To collect the most up-to-date information, we supplemented progress report data with questionnaires to NSF to obtain updated project status, cost, and schedule data as of July 2025.

For both objectives, we interviewed agency officials knowledgeable about the status of NSF's major and midscale project portfolios and process for awarding new projects. Further, we reviewed relevant documentation including project risk reports and risk registers, information on available scope reduction options, and other NSF documents—such as NSF's *Research Infrastructure Guide*—to collect additional information about the major projects that were in design or construction.[3] To describe the NSF project selection process, we reviewed agency policies and budget documentation regarding the process that NSF follows to make project award selections.

We assessed the reliability of project data by obtaining supporting documentation when possible, conducting routine checks for consistency with other information contained in the documentation provided by NSF, and clarifying any discrepancies with NSF project officials. Through this

[1]The provision is contained within the explanatory statement printed at 170. Cong. Rec. S1398 that accompanied the Consolidated Appropriations Act, 2024, Pub. L. No. 118-42, 138 Stat. 25.

[2]Our prior report on this issue is GAO, *National Science Foundation: Five Major Facilities Projects Experienced Delays*, GAO-24-107044 (Washington, D.C.: June 12, 2024).

[3]National Science Foundation, *Research Infrastructure Guide*, NSF 25-200 (September 2025).

process, we determined that the project data were sufficiently reliable for our purpose of describing information available on the projects' cost and schedule performance and current status.

We conducted this performance audit from September 2024 to February 2026 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Summaries of the National Science Foundation's Major Projects Under Construction

This appendix provides individual summaries of the seven National Science Foundation (NSF) major projects that were under construction as of July 2025. Each project's summary is based on project documents and other information that NSF officials provided and includes the following:

- an overview of the project and its purpose;
- a timeline identifying key project dates, including the date of the original construction award, which we report as the start of construction;
- project information, such as the project's scheduled completion date for construction (including schedule contingency), the type and latest amounts of the awards for construction, the responsible NSF directorate, project partners, and expected duration of operations;
- a table summarizing the project's current status and its cost and any cost or schedule increases or scope reductions made under NSF's No Cost Overrun policy and changes since our June 2024 report;[1]
- a summary of the project's cost and schedule performance history; and
- information on remaining project risks and potential for cost or schedule increases, including the amount of remaining contingency and scope reduction options.

[1]GAO, *National Science Foundation: Five Major Facilities Projects Experienced Delays*, GAO-24-107044 (Washington, D.C.: June 12, 2024).

Antarctic Infrastructure Recapitalization (AIR) Program

Source: National Science Foundation (NSF). | GAO-26-107842

Location: Antarctica, including all U.S. Antarctic Program locations

Contractor/awardee: Multiple cooperative support agreements, contracts, and interagency agreements

National Science Foundation Directorate: Geosciences

Description: The National Science Foundation's (NSF) Antarctic Infrastructure Recapitalization (AIR) program is an enduring funding source intended to modernize and sustain a portfolio of essential U.S. Antarctic infrastructure. Projects include upgrades to facilities at McMurdo Station, improvements to utility systems, enhanced equipment to deliver supplies to the South Pole, and modernized communications and airfield equipment.

N/A
percent complete

2029
Current projected end of the final project in the portfolio

Current Snapshot

The projects currently funded under the AIR program are estimated to cost $155M in total. Several projects have experienced schedule delays and one project experienced cost growth. The cost of the McMurdo Offload Infrastructure project rose by $10 million due to subcontract delays that, if continued, could further affect the project schedule. The McMurdo Switchgear project has been delayed, due to subcontract award issues.

In contrast, other projects such as improvements to the South Pole Traverse (SPoT) are progressing largely as planned with limited use of contingency funding. Portfolio risks are related to the environmental and logistical challenges of work in Antarctica.

	Authorized portfolio budget	Estimated total portfolio cost[a]	Estimated completion date
Initial	N/A	$55.0M	Varies by project
Current (as of July 2025)	N/A	$155.0M	Varies by project
Total change since construction start	N/A	▲$100.0M since AIR inception	N/A

[a]Does not include AIR portfolio projects in design.

M = million, ▲ = Increase

Source: GAO review of National Science Foundation (NSF) information. | GAO-26-107842

Source: National Science Foundation (NSF). | GAO-26-107842

Source: National Science Foundation (NSF). | GAO-26-107842

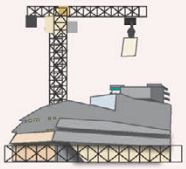
Future Risks/Anticipated Milestones

The AIR program continues to face challenges in executing large, complex projects in Antarctica's extreme environment. Several projects, such as the McMurdo Offload Infrastructure and Tactical Air Navigation are behind schedule and further delays in contracting, material delivery, or fieldwork seasons could increase overall costs and extend completion dates.

Source: GAO analysis of National Science Foundation (NSF) information; green icons (Phoenix Icons/adobestock.com). | GAO-26-107842

Vera C. Rubin Observatory

Source: Rubin Obs/NSF/AURA (B. Stalder). | GAO-26-107842



98%
complete

Location: Cerro Pachón, Chile

Contractor/awardee: Cooperative support agreement with the Association of Universities for Research in Astronomy

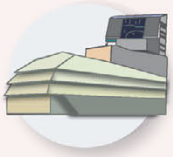
National Science Foundation Directorate: Mathematical and Physical Sciences

Description: NSF's Vera C. Rubin (Rubin) Observatory, an 8.4-meter, wide-field optical telescope, is intended to take images of the entire visible southern sky—every 3 days for the first decade—using the world's largest digital camera (3 billion pixels), which is provided by the Department of Energy.

2003
Start of design

2013
Final design review

2014
Construction award



January 2026
Planned completion

2070s
End of operations

Source: GAO analysis of National Science Foundation (NSF) information; Rubin/NSF/Association of Universities for Research in Astronomy (B. Stalder) (icons); green icons (Phoenix Icons/adobestock.com); sign icon (GAO). | GAO-26-107842

Current Snapshot

The Rubin Observatory is nearing completion and has achieved significant milestones, including completing the telescope, capturing its first images, and conducting science quality-checks and verification of over 1,000 images released in June 2025 as part of its First Look event. NSF officials stated the project held two Combined Construction Completion and Operational Readiness Reviews in July and October 2025. During the second review, the project was closed out and the responsibility for the Observatory was handed over to the Operations team. A small number of minor items remain to be completed at no extra cost and with no effect on the operational readiness, with an estimated completion date in July 2026.

	Authorized total project cost	Estimated total project cost	Estimated completion date
Initial	$473.0M	$467.8M	August 2022
Current (as of July 2025)	$571.0M No change since June 2024.	▲$571.0M This is a $21.4 million increase since June 2024.	▲January 2026 This is a 10-month increase since June 2024.
Total change since construction start	▲$98.0M	▲$103.2M	▲41 month increase

M = million, ▲ = Increase

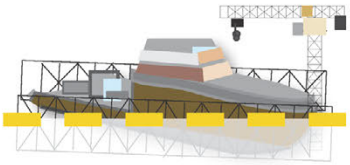
Source: GAO review of National Science Foundation (NSF) information. | GAO-26-107842

Future Risks/Anticipated Milestones

In January 2025, NSF obligated $12.1 million in additional baseline funding to address residual schedule delays and associated costs and to provide contingency for potential risks. These costs were within the authorized total project cost and the project remains within its cost baseline.

Regional Class Research Vessels

Source: National Science Foundation (NSF). | GAO-26-107842



73%
complete

Location: Construction site in Houma, Louisiana

Contractor/awardee: Cooperative agreement with Oregon State University, with subcontracts to Bollinger Houma Shipyards, LLC

National Science Foundation Directorate: Geosciences

Description: The NSF's Regional Class Research Vessels (RCRV) project is building three ships that are intended to allow scientists to conduct fundamental research within primarily U.S. territorial waters. These vessels are intended to provide enhanced capabilities compared with the vessels being retired. NSF plans to deploy and operate the first vessel on the U.S. West Coast.

2012
Start of design

2016
Final design review

2017
Construction award

January 2022
Project re-baselined

August 2022
Project re-baselined

April 2029
Planned completion

2050s
End of operations

Source: National Science Foundation (NSF); icons (GAO); green icons (PhoenixIcons/adobestock.com); icons (GAO). | GAO-26-107842

Current Snapshot

All three ships are concurrently under construction. Several anticipated risks, such as workforce shortages, space constraints, and hurricane damage and disruption increased the project's estimated cost and extended the schedule. The shipyard replaced the electrical subcontractor in June 2025 after continued performance problems. To increase the budget contingency, NSF reduced the scope by $2.5 million by acquiring fewer spare propulsion drives than planned. Additionally, NSF authorized $8.5 million in management reserves to bring the estimated total project cost to $400 million.

	Authorized total project cost	Estimated total project cost	Estimated completion date
Initial	$365.0M	$354.0M	July 2024
Current (as of July 2025)	$400.0M No change since June 2024.	▲$400.0M This is a $8.5 million increase since June 2024.	▲April 2029 This is a 27-month increase since June 2024.
Total change since construction start	▲$35.0M increase	▲$46.0M increase	▲57-month increase

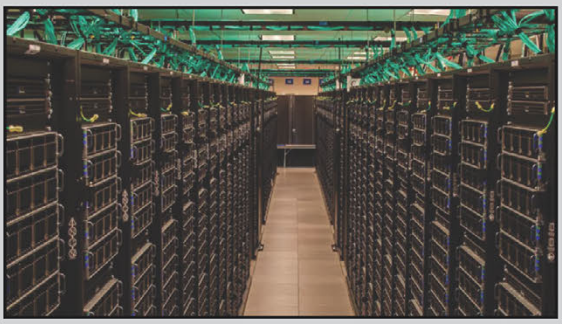
M = million, ▲ = Increase

Source: GAO review of National Science Foundation (NSF) information. | GAO-26-107842

Future Risks/Anticipated Milestones

The RCRV project is on the Office of the Director's Watch List and NSF is closely monitoring its cost and schedule. The awardee anticipates the three ships will be delivered in December 2026, April 2027, and July 2027. At the awardee's request, the shipyard hired a new project manager, which has resulted in a realistic construction schedule and improved collaboration, according to NSF. However, ongoing challenges could increase the likelihood that risks to the project are realized.

Leadership Class Computing Facility (LCCF) project



Source: National Science Foundation (NSF). | GAO-26-107842

Note: Photograph above depicts NSF's most advanced computing system lkicurrently in operation, known as Frontera.

Location: Austin, Texas

Contractor/awardee: Cooperative agreement with the Texas Advanced Computing Center at the University of Texas at Austin

National Science Foundation Directorate: Computer and Information Science and Engineering

Description: The NSF's Leadership Class Computing Facility (LCCF) project is intended to provide advanced computational capabilities and critical software and services to enable transformative research in all areas of science and engineering. According to NSF officials, this might include extremely detailed simulations of biological molecules, analyses of very large data streams to create high-resolution Earth maps, computing for emergency response scenarios, and artificial intelligence applications.

27%
complete

2019
Start of design

2020
Conceptual design review

January 2022
Preliminary design review

April 2023
Final design review

July 2024
Construction award

March 2028
Planned completion date

2037
End of operations

Source: National Science Foundation (NSF); green icons (Phoenix Icons/adobestock.com); icons (GAO). | GAO-26-107842

Current Snapshot

The LCCF project moved from the design phase into construction in July 2024. Due to budgetary uncertainty and other factors, such as increased prices for computer components driven by supply and demand challenges, the project deferred major procurements originally planned for fiscal year 2025 until fiscal year 2026. NSF reports that the procurement delays are not currently expected to result in significant increases to the overall project schedule.

	Authorized total project cost	Estimated total project cost	Estimated completion date
Initial	$457.4M	$457.4M	April 2028
Current (as of July 2025)	$457.4M	$457.4M	March 2028
Total change since construction start	No change	No change	▼1 month decrease

M = million ▼ = Decrease

Source: GAO review of National Science Foundation (NSF) information. | GAO-26-107842

Future Risks/Anticipated Milestones

NSF expects that the supercomputer contract, which represents approximately 40 percent of the baseline construction cost, will be executed by the beginning of fiscal year 2026, reducing the risk exposure for the LCCF project. Nevertheless, market conditions, including higher demand for technology products, funding uncertainties, and remaining procurement steps pose risks to the project cost and schedule.

Antarctic Infrastructure Modernization for Science (AIMS)

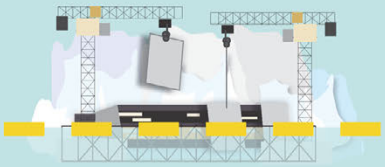
Source: National Science Foundation (NSF). | GAO-26-107842

Location: McMurdo Station, Antarctica

Contractor/awardee: Leidos

National Science Foundation Directorate: Geosciences

Description: The NSF's Antarctic Infrastructure Modernization for Science (AIMS) project is intended to modernize the core infrastructure of McMurdo Station in Antarctica. The currently funded project includes construction of a new lodging facility to ensure adequate bed space to support the station workforce, scientists, and construction workers.



80%
complete

2014
Start of design

2018
Final design review

2019
Construction award

March 2020
Construction paused due to pandemic

June 2022
Project re-baselined

May 2027
Planned completion

2062-2077
End of operations

Source: National Science Foundation (NSF); Leidos (building icons); green icons (Phoenix Icons/adobestock.com); icons (GAO). | GAO-26-107842

Current Snapshot

NSF is further reducing the scope of AIMS from two buildings to one. In May 2024, NSF provided the contractor with notice to discontinue construction of the Vehicle Equipment and Operations Center (VEOC). This further reduces the project scope from the original six buildings to one. Future VEOC work is being transitioned to the Antarctic Infrastructure Recapitalization (AIR) program. As of July 2025, NSF was evaluating whether to include de-scoped components of the original AIMS project in the AIR program based on their priority relative to other recapitalization needs across Antarctica.

	Authorized total project cost	Estimated total project cost	Estimated completion date
Initial	$410.4M	$410.4M	April 2028
Current (as of July 2025)	$410.4M	N/A	▲May 2027 This is a 4-month increase since June 2024.
Total change since construction start	No change	N/A	▼11-month decrease

M = million, ▲= Increase, ▼ = Decrease

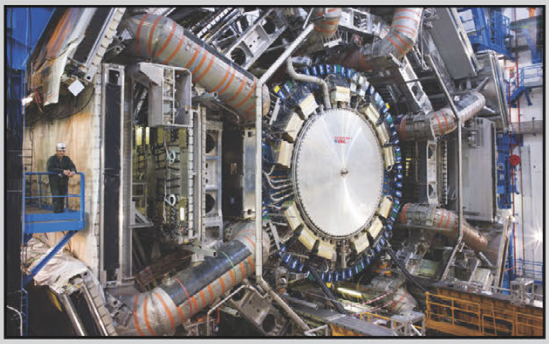
Source: GAO review of National Science Foundation (NSF) information. | GAO-26-107842

Future Risks/Anticipated Milestones

The AIMS project is on the Office of the Director's Watch List. At the time of the first re-baseline decision (June 2022), construction on the four buildings removed from the project scope had not yet begun. Only the lodging facility remains part of the project. It experienced construction delays during 2024, but was enclosed in January 2025, allowing for interior work to continue during the winter season. While expected completion is May 2027, NSF anticipates the lodging facility will be ready for use by March 2026. The project is also tracking other possible cost and schedule risks to the lodging facility including labor shortages, delays or damage to materials during transport to Antarctica, and damage to major construction equipment.

Large Hadron Collider High Luminosity (HL-LHC) Upgrade Program

A Toroidal LHC Apparatus (ATLAS) Detector Upgrade



Source: European Organization for Nuclear Research. | GAO-26-107842

Note: photograph above depicts the A Toroidal Large Hadron Collider Apparatus (ATLAS) detector.

Location: Geneva, Switzerland

Contractor/awardee: Cooperative agreement with Columbia University

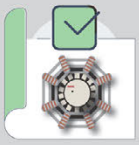
National Science Foundation Directorate: Geosciences

Description: A Toroidal LHC Apparatus (ATLAS) is one of two general-purpose detector upgrades at the Large Hadron Collider (LHC) operated by the European Organization for Nuclear Research (CERN). It investigates a wide range of high energy physics topics, from the condition of the early universe to theoretical extra dimensions and particles that could make up dark matter.

59%
complete

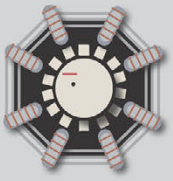
2015
Start of design

2019
Final design review



2020
Construction award

August 2023
Project re-baselined



December 2028
Planned completion

2038
End of operations

Source: National Science Foundation (NSF); green iconsicons (GAO). | GAO-26-107842

Current Snapshot

The ATLAS upgrade has continued pre-production activities for the detector and other components. Although the project has experienced delays due to supply chain challenges and production and testing issues, NSF expects that the ATLAS upgrade will be completed by its long shutdown timeline (e.g. extended dormant period for maintenance and upgrades). CERN has delayed the start of the long shutdown, allowing for more float in the schedule, or the amount of time an activity can be delayed without impacting the project's overall completion date.

	Authorized total project cost	Estimated total project cost	Estimated completion date
Initial	$75.0M	$75.0M	May 2026
Current (as of July 2025)	$82.8M No change since June 2024.	$82.8M No change since June 2024.	▲December 2028 This is a 5-month increase from June 2024.
Total change since construction start	▲$7.8M increase	▲$7.8M increase	▲31-month increase

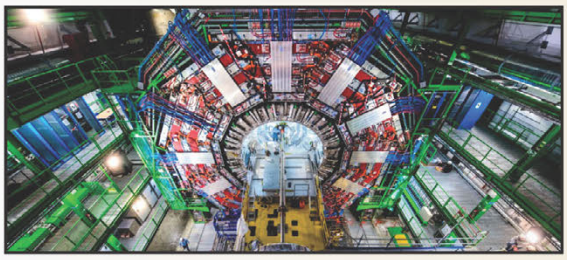
M = million, ▲ = Increase

Source: GAO review of National Science Foundation (NSF) information. | GAO-26-107842

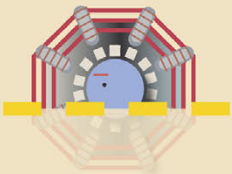
Future Risks/Anticipated Milestones

The ATLAS project's current spending and projected final costs are in line with the revised budget, which was established in the August 2023 re-baseline. While NSF has not reported any concerns with the costs for the project, it is tracking possible risks to the cost including volatility in commodity and labor markets, CERN delays, and loss of scientific contributions from other institutions which would need to be recovered by the ATLAS project team.

Compact Muon Solenoid (CMS) Detector Upgrade



Source: National Science Foundation (NSF). | GAO-26-107842



56%
complete

Location: Geneva, Switzerland

Contractor/awardee: Cooperative agreement with Cornell University

National Science Foundation Directorate: Mathematical and Physical Sciences

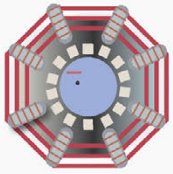
Description: The Compact Muon Solenoid (CMS) is one of two general-purpose detector upgrades at the LHC operated by the European Organization for Nuclear Research (CERN). It has broad physics objectives ranging from studying the Standard Model of particle physics to searching for extra dimensions and particles that could make up dark matter.

2015
Start of design

2019
Final design review

2020
Construction award

August 2023
Project re-baselined



June 2028
Planned completion

2038
End of operations

Source: National Science Foundation (NSF); icons (GAO). | GAO-26-107842

Current Snapshot

The CMS upgrade has continued pre-production activities for components that are a part of the detector and additional components. NSF expects that the CMS upgrade will be completed by the date CERN needs it despite reported labor challenges and issues in procuring, installing, and testing custom, technically complex components. Even with current schedule delays at CERN due to these issues, NSF is pushing for early delivery of the CMS upgrade.

	Autho-rized total project cost	Estimated total project cost	Estimated completion date
Initial	$78.0M	$77.2M	August 2026
Current (as of July 2025)	$88.0M No change since June 2024.	$88.0M No change since June 2024.	▼ June 2028 This is a 1-month decrease from June 2024.
Total change since construction start	▲$10.0M increase	▲$10.8M increase	▲22-month increase

M = million, ▲ = Increase ▼ = Decrease

Source: GAO review of National Science Foundation (NSF) information. | GAO-26-107842

Future Risks/Anticipated Milestones

Costs remain within the August 2023 re-baseline. Potential cost risks include abor market volatility, foreign exchange rates, and import/export issues.

Appendix III: Summaries of the National Science Foundation's Major Projects in Design

This appendix provides individual summaries of the six National Science Foundation (NSF) major projects that were in design as of July 2025. No construction funds had been awarded for these projects and all cost, schedule, scope, and design information was subject to change. The project summaries are based on project documents and other information that NSF officials provided and include the following:

- an overview of the project and its purpose;
- a timeline identifying key project dates;
- project information, such as the expected date for completion of construction; the anticipated type of awards for construction; the responsible NSF directorate; project partners; and expected duration of operations;
- a summary of the project's current status;
- a summary of the project's design and construction costs, if available, and the budget account NSF planned to use for construction of the project;[1] and
- information on remaining project risks.

[1]Costs are reported in then-year dollars, which means that NSF or the recipient converted base-year dollars by applying an inflation index. According to NSF policy, inflation is a part of NSF's budgeting and project planning.

Antarctic Research Vessel

Project Description:
The National Science Foundation (NSF) Antarctic Research Vessel is planned to replace the retiring Nathaniel B. Palmer icebreaker with a new research vessel. The vessel is intended to meet NSF's science mission goals through increased access to difficult-to-reach areas and to transport more scientists and equipment to Antarctica.

Project Status:
As of July 2025, NSF paused the contractor selection process while the agency coordinates with other federal partners to align their approach with an executive order pertaining to the shipbuilding industry. Once selected, the contractor will manage construction. NSF has not yet established the construction cost, schedule, or scope for the Antarctic Research Vessel project.

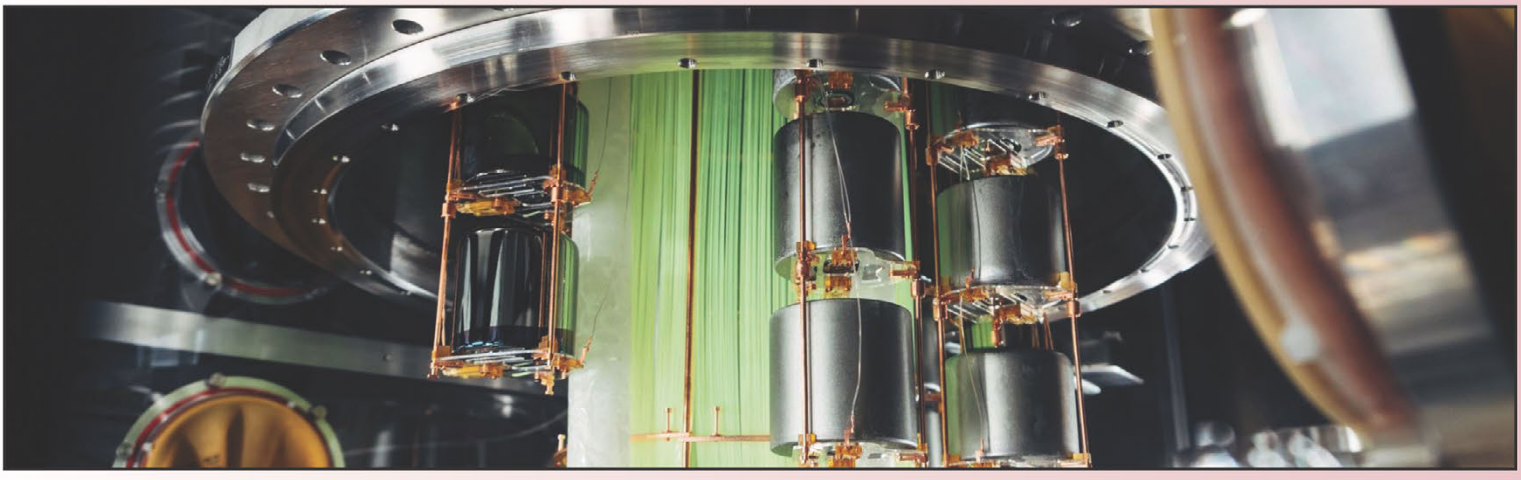
Source: National Science Foundation (NSF). | GAO-26-107842

Note: Rendering of the project's conceptual design.

Large Enriched Germanium Experiment for Neutrinoless Double-Beta Decay

Project Description: This project proposes a deep-underground experiment using about one metric ton of enriched germanium to detect neutrinoless double-beta decay—a hypothetical type of nuclear decay. Observing this type of nuclear decay would help answer one of the most significant unresolved questions about the creation of the universe: why is there more matter than antimatter in existence when the Big Bang should theoretically have created equal amounts of each.

Project Status: As of July 2025, NSF had approved the project to enter the Preliminary Design Phase and pre-approved advancement to the Final Design Phase contingent on completion of an independent cost estimate. The U.S. Space Force is preparing the independent cost estimate in advance of a planned Final Design Review in the fourth quarter of fiscal year 2026. NSF plans to decide whether to proceed to construction in fiscal year 2027.



Source: National Science Foundation (NSF). | GAO-26-107842

Next-Generation Very Large Array

Source: National Science Foundation (NSF). | GAO-26-107842

Project Description: The NSF Next-Generation Very Large Array is a proposed continent-spanning radio telescope composed of hundreds of antennas operating as one instrument. The array is designed to provide higher sensitivity than current U.S. centimeter-wavelength radio telescopes. This approach will enable study of planetary system formation, probing the initial conditions for life in other planetary systems; charting the assembly, structure, and evolution of galaxies; fundamental tests of gravity using galactic center pulsars; and understanding the formation of supermassive black holes.

Project Status: NSF completed the Conceptual Design Review in September 2024 and, as of July 2025, was reviewing the panel report before deciding whether to proceed to the preliminary design phase. Prototype antenna testing at the Very Large Array site near Socorro, New Mexico, continues—funded separately from the design award reducing the risk of technical issues and unexpected costs.

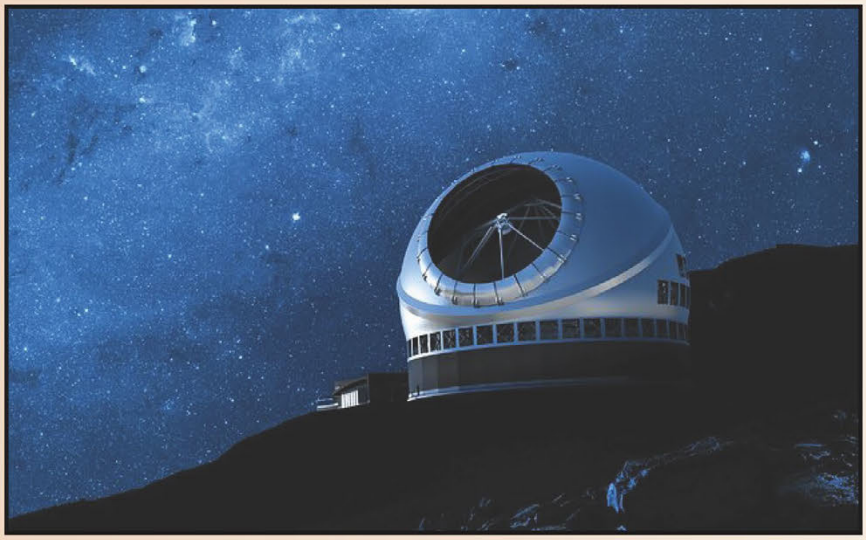
Summit Station Modernization and Recapitalization (SuMR)

Source: National Science Foundation (NSF). | GAO-26-107842

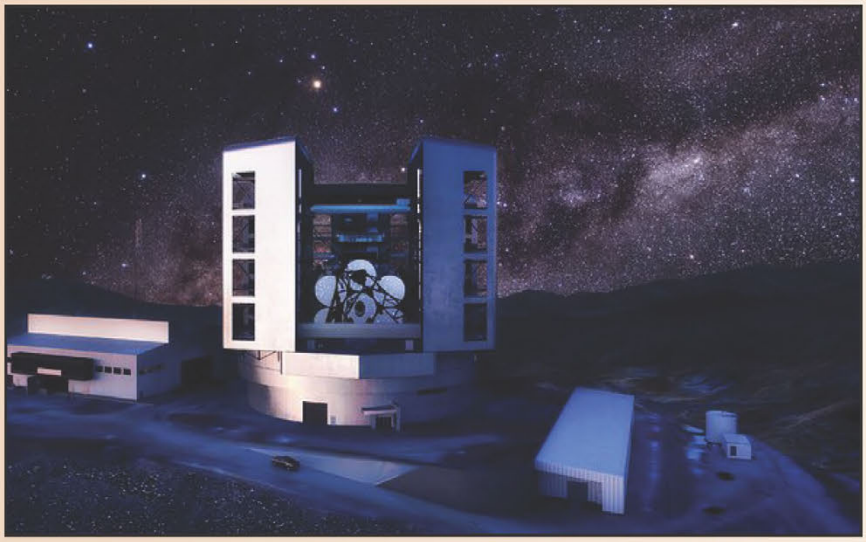
Project Description: The NSF Summit Station Modernization and Recapitalization (SuMR) project is planned to modernize NSF's Summit Station on the Greenland ice sheet. The project replaces aging facilities with elevated buildings to resist snow burial and as well as improve safety and energy efficiency. The modernized station is intended to support atmospheric, climate, and astrophysical research while reducing operational and logistics costs.

Project Status: Following the February 2025 Preliminary Design Review and the May 2025 facilities readiness review, NSF plans to finalize its acquisition strategy. Under this approach, NSF plans to complete design—through an interagency agreement with the U.S. Army Corps of Engineers—and plans to hold a design workshop in October 2025 to further develop and refine the project's design. NSF plans to update the independent cost estimate based on updated design and logistics assumptions in the second quarter of fiscal year 2026. After these actions, NSF plans to consider advancement of the project to the Final Design Phase in the third quarter of fiscal year 2026.

U.S. Extremely Large Telescope (U.S.-ELT) Program



Source: Courtesy of Thirty Meter Telescope International Observatory. | GAO-26-107842



Source: Giant Magellan Telescope – GMTO Corporation (CC BY-NC-ND 4.0 Deed | Attribution-NonCommercial-NoDerivs 4.0 International | Creative Commons). | GAO-26-107842

Project Description: The U.S. Extremely Large Telescope (US-ELT) Program was originally proposed to include construction of two new telescopes—the Thirty-Meter Telescope and the Giant Magellan Telescope. The goal is to enable high-fidelity observations of rare objects, including potentially habitable planets orbiting other stars, and rare classes of transient events.

Project Status: Because of previous investments by nonfederal partners, the program entered the design stage ready for an immediate Preliminary Design Review in 2023. In May 2025, NSF approved the Giant Magellan Telescope component to advance to the Final Design Phase; as of July 2025, NSF had decided not to advance the Thirty-Meter Telescope due to affordability concerns. The program is developing milestone dates for the Giant Magellan Telescope. NSF plans to prepare a cost estimate of its proposed scope by March 2026. The Giant Magellan Telescope design work continues with partner funding and NSF did not plan additional design-stage funding as of July 2025.

Appendix IV: Summaries of the National Science Foundation's Midscale Projects in Implementation

This appendix provides individual summaries of the eight National Science Foundation (NSF) midscale projects that were in implementation as of July 2025. Each project's summary is based on project documents and other information that NSF officials provided and includes the following:

- an overview of the project and its purpose;
- project information, such as the project's scheduled completion date, the type and latest amounts of the awards for implementation, and the responsible NSF directorate;
- the project's current status and cost and schedule performance history since our June 2024 report;[1]
- the latest implementation award's total project cost, including the performance measurement baseline and budget contingency; and
- information on remaining project risks and potential for cost or schedule increases, if available, including the amount of remaining contingency and scope reduction options.

[1]GAO, *National Science Foundation: Five Major Facilities Projects Experienced Delays*, GAO-24-107044 (Washington, D.C.: June 12, 2024).

Midscale Research Infrastructure Track 2 Projects (as of July 2025)

Project Description: Most projects in the National Science Foundation's (NSF's) Midscale Research Infrastructure Track 2 portfolio remain within their original cost baselines and are progressing toward completion. As of July 2025, the portfolio comprises eight projects in implementation, as well as one suspended project—the Airborne Phased Array Radar project. Several projects, such as the Research Data Ecosystem, Global Ocean Biogeochemical Array, and Consortium Network for Advanced Nuclear Magnetic Resonance, continue implementation toward planned milestones. For one project, Distributed Energy Resource Connect, cost increased due to pandemic-related impacts, but it continues to advance on schedule.

However, two projects demonstrate more significant challenges. The Compact X-Ray Free Electron Laser faces delays in equipment acquisition raising concerns that it may be necessary to adjust the project's budget, timelines, or other parameters. More critically, the Airborne Phased Array Radar project was terminated in April 2025 due to the subcontractor's inability to resolve technical and cost issues. Termination of the project means the project will be cancelled.

Performance of NSF's Midscale Projects in Implementation, as of July 2025

Project and Date Baselined	Original Total Project Cost Estimate ($M)	Current Total Project Cost Estimate and Change from Original Cost Estimate ($M)	Status
High Magnetic Field Baseline (2020)	32.7	32.7	Costs remain within the baseline and the schedule is at risk. Delivery of the 20-tesla magnet is now expected in December 2025—later than planned due to supply chain delays—and NSF reports the later delivery will require a no-cost extension.
Distributed Energy Resource Connect (2020)	39.5	▲42.0 (+2.5)	Costs exceed the original baseline but the schedule remains on track. NSF attributes the increase to pandemic-related impacts; NSF reports performance is positive and activities are on track for completion by the award end date, October 2025.
Global Ocean Biogeochemical Array (2020)	52.9	52.9	Costs remain within the baseline and the schedule remains on track. Deployment of robotic floats is ongoing, with more than three-quarters of planned units acquired and more than half deployed. The award end date is October 2026.

Source: National Science Foundation (NSF). | GAO-26-107842

Midscale Research Infrastructure Track 2 Projects (as of July 2025)

Performance of NSF's Midscale Projects in Implementation, as of July 2025

Project and Date Baselined	Original Total Project Cost Estimate ($M)	Current Total Project Cost Estimate and Change from Original Cost Estimate ($M)	Status
Consortium Network for Advanced Network for Magnetic Resonance (2021)	39.7	39.7	Costs and schedule remain within baseline. Final cyberinfrastructure components are in development and are expected to be delivered by the award deadline. The award end date is September 2025.
Research Data Ecosystem (2022)	38.4	38.4	Costs and schedule remain within baseline, as confirmed by NSF during a recent site visit. The award end date is January 2027.
Compact X-Ray Free Electron Laser (2023)	90.8	90.8	Costs remain within baseline but the schedule is delayed. Progress has slowed due to deferred equipment acquisitions. NSF notes the project may need to adjust its cost and schedule plan or make other changes if procurement risks persist. The award end date is February 2028.
Advanced Millimeter Survey Instrumentation in Chile (2023)	52.7	52.7	Costs and schedule remain within baseline. Construction of the photovoltaic array is underway and some tasks are being deferred until funding decisions are finalized. The award end date is April 2028.
Airborne Phased Array Radar (2023)	91.8	▼15.2 (-76.6)	Project experienced significant delays, cost increases, and technical challenges due to subcontractor performance issues. NSF suspended the award in April 2025.
SafeInsights: Large-Scale Learning Science and Engineering Infrastructure (2024)	89.9	89.9	Costs and schedule remain within baseline. Two risks materialized and will require use of contingency funds, which NSF will seek approval for in the next funding cycle. The award end date is April 2029.

Source: National Science Foundation (NSF). | GAO-26-107842

Appendix V: GAO Contact and Staff Acknowledgments

GAO Contact

Hilary M. Benedict, BenedictH@gao.gov

Staff Acknowledgments

In addition to the contact named above, Eric Bachhuber (Assistant Director), Daniel Ryan Singleton (Analyst in Charge), Sarah Harvey, Ian Reed, and Casie Venable made key contributions to the report. Also contributing were Virginia Chanley, Patrick Harner, Curtis Martin, and Jenique Meekins.

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