BROADER IMPACTS:

An Analysis of Media Coverage of the National Science Foundation

(January 2025–January 2026)

National Security

Analysis of Media Coverage

This analysis examines the sentiment and substance of media coverage of the National Science Foundation in over 3,800 articles published from January 2025 through January 2026. It explores how a range of media sources — magazines, newspapers, and other news outlets as well as television stations, radio stations, and university websites — have portrayed the agency's broader impacts and value amidst budget cuts and project terminations. While media coverage often focuses on the "Intellectual Merit" of scientific achievements, this analysis focuses on NSF's "Broader Impacts" — the tangible benefits to society that matter most to the public including improvements in daily life and stronger communities.

This series is organized around six key Broader Impacts dimensions:

- Economic Competitiveness and Innovation
- National Security
- STEM Education
- Workforce Development
- Societal Well-being
- Research Infrastructure

The findings illustrate that NSF remains a vital engine for maintaining America's strength, fostering innovation, and building a foundation for families to thrive across every state.

National Security

National security is a core mandate of the legislation that created NSF seventy-five years ago. NSF fulfills this responsibility by investing in scientific knowledge, workforce capabilities, and technologies that keep the United States technologically resilient and prepared for emerging threats. These investments help sustain US strength in defense, intelligence and infrastructure protection.

National security, however, is more than military defense. It also depends on sustaining foundational discoveries necessary for economic strength, technological leadership and public safety. U.S. security relies on NSF-backed leadership in AI, biotechnology, quantum science, and advanced manufacturing — foundational fields that directly strengthen cybersecurity, intelligence analysis, and supply chain resilience.

NSF investments also support the development of the highly skilled workforce who can use these innovations to protect the government, industry and the nation's communities. Together, NSF investments help ensure that the U.S. will remain safe and secure.

NSF investments in research, technology, and workforce development keep the United States resilient, competitive, and secure.

NSF's Early Impact on National Security

Modern national security science was born in World War II, when an unprecedented government-academic partnership delivered critical innovations. Under the Office of Scientific Research and Development, researchers developed radar, radio proximity fuzes, synthetic rubber, guided missiles, and mass-produced penicillin—breakthroughs that secured victory and proved basic research yields powerful practical benefits. This success inspired the 1950 creation of NSF to ensure long-term U.S. military power through sustained peacetime innovation. Since the Cold War, NSF's "curiosity-driven" investments laid the groundwork for technologies defining modern defense and intelligence:

- **Digital Communications and Satellites:** NSF-backed algorithms for data compression and early barcode technology revolutionized logistics and reconnaissance. Later investments in Qualcomm built the backbone for the secure mobile communications used on today's battlefields.
- **Advanced Materials and Manufacturing:** Decades of NSF-led research yielded the heat-resistant alloys for jet engines, ultra-strong carbon fibers for stealth aircraft, ceramics for armor, and 3-D manufacturing capabilities that allow for on-demand field production of lightweight drone and weapon components.
- **Weapons and Intelligence Advantages:** NSF-supported computer science and mathematics research provided a strategic edge in information security and cryptography. Funding for machine vision and pattern recognition led to breakthroughs in satellite image interpretation, facial recognition, and anomaly detection. Supercomputing advances enabled the analysis of large datasets, sifting signals from noise. Investments in miniaturized electronics contributed to precision-guided munitions, radar, sonar, and high-speed signal processing. Similarly, basic research yielded night-vision technology, GPS-guided weapons, and aircraft design improvements.
- **Lasers and Fiber-Optics:** NSF grants enabled researchers to improve every aspect of laser and fiber-optic performance—making lasers more powerful, efficient, and tunable. These dramatic improvements enabled the solid-state lasers now ubiquitous in rangefinders, targeting systems, and laser-guided munitions.

NSF investments laid the foundation for satellites, secure communications, advanced materials, and intelligence technologies central to modern defense.

Media coverage over the last year highlighted concerns that budget cuts to NSF would weaken U.S. security. In *Defense News*, Frank Kendall, a former leader of strategic defense under several administrations as well as the Air Force stated "the foundation of military superiority of the United States, and therefore of our national security, rests on our investments in science and technology." He explains that defense innovation comes in phases—basic research that takes place in colleges and universities and then application of the newly developed science into products. He was concerned that much of the military's science and technology funding that supports this work has been cut even after staying level the previous year.

Former Defense Secretary Chuck Hagel also underscored the importance of NSF investments in science and technology. In a piece from Reuters he warned that China is outpacing the U.S. in important technology fields. The article noted that between 2003-2007, China led the world in just three of sixty-four technologies—under 5%. As of 2023, it led in fifty-seven of those technologies—almost 90%.

Media coverage also included stories on other dimensions of national security. For example, in a piece by New America, the National Security Commission on Emerging Biotechnology (NSCEB) chaired by Senator Todd Young warned that the United States was losing ground in biotechnology to China and was poised to lose even more. The commission argued that just as AI literacy became a priority in national security, so should biotechnology. In *The Bangor Daily News*, a physics professor cautioned that scaling back federal research support will lead to giving up leadership in energy innovation and quantum computing, critical areas for national security.

The Center for Strategic and International Studies reduced complex national security arguments to a simple assertion: increasing overall defense spending while reducing research funds overlooks the connection between research and security. NSF's longstanding support of R & D has driven innovation in areas essential to national security including wireless communication, supercomputers, biothreat countermeasures and nuclear security. As the Association of American Universities summarized—"Since World War II, the government-university partnership has underpinned American military strength. Cuts to research make the U.S. less secure and put our troops in harm's way."

Americans across the political spectrum recognize the importance of investments in national security R&D. According to a 2025 national poll from *The Science Coalition:* More than 86% believe, "Developing new defense capabilities and national security technologies to keep America safe." In 2025, the *Ronald Reagan Presidential Foundation and Institute* found that 87% of Americans believe it is important for the U.S. to have the "most powerful military in the world.

NSF: The Hidden Architecture of Defense

While headlines focus on national security hardware, the science powering them begins in university labs. NSF investments generate tangible assets for warfighters, intelligence analysts, and infrastructure defenders.

- **Next-Generation Warfighter Protection:** NSF investments in materials science are revolutionizing warfighter protection. Harvard bioengineer and Army Lieutenant Colonel Kit Parker used NSF funding to leverage spider silk's molecular properties, creating flexible, lightweight bulletproof vests that offer high protection without restricting mobility. Additionally, NSF-backed small business innovation led to Hemogrip, a sprayable biopolymer foam that stanches traumatic bleeding in seconds, providing a critical life-saving tool for battlefield casualty care.
- **Intelligence Beyond the Algorithm:** NSF's support for social and behavioral sciences equips the intelligence community to understand why threats emerge. NSF-funded researchers developed dynamic network models of international relations that predict conflict hotspots five to ten years in advance with superior accuracy. Furthermore, field research by anthropologist Scott Atran and psychologist Jeremy Ginges dispelled the "irrational actor" myth, uncovering social dynamics of extremism that defense agencies now use to disrupt terrorist recruitment pipelines.
- **Biosecurity and Chemical Detection:** NSF research provides the sensitivity and speed required for early threat detection. Penn State researchers created a sensor merging Raman spectroscopy with bio-inspired "slippery surface" technology to identify molecular fingerprints of explosives and biological agents in minute quantities. Furthermore, NSF's $75 million investment in "BioFoundries" accelerates bio-manufacturing, enabling the U.S. to rapidly engineer medical countermeasures against engineered pathogens.
- **Infrastructure Resilience:** National security now encompasses the stability of automated systems. Through the "Strengthening American Infrastructure" (SAI) initiative, researchers model cyberattacks on self-driving vehicles to help defense planners secure convoys against compromised sensors. NSF investments have also fielded autonomous robots to inspect dams and underwater ports for sabotage, while algorithms guiding today's military combat vehicles trace back to NSF-supported faculty in early DARPA Grand Challenges, enabling supply convoys to maneuver through contested environments.

NSF investments translate foundational university research into advanced protection for warfighters, smarter intelligence tools, rapid biosecurity detection, and resilient national infrastructure.

A Cybercorps to Keep America Secure

To address the critical shortage of cybersecurity professionals protecting U.S. infrastructure, Iowa State University is using NSF funding to provide scholarships through the 'CyberCorps Scholarship for Service' program, designed to equip Iowa talent with the training they need to protect the country's infrastructure. Participants will go on to work for local, tribal or federal governments among other qualifying organizations.

Developing a workforce for leading technologies such as artificial intelligence, next-generation wireless and smart manufacturing is essential to keep the country secure. This NSF investment helps ensure that the country will have the talent it needs.

Federal Funds Boosts Local National Security Initiative

The words "quantum information science" and "quantum sensing" may seem abstract and unfamiliar to many Americans. NSF, however, recognizes that research in these fields is critical to national security. *UND Today*, the news source for the University of North Dakota highlighted this in its reporting of NSF grants awarded to two of its professors.

These grants were part of NSF's "Expanding Capacity in Quantum Information Science and Engineering" (Expand QISE) program that focuses on building world class talent in every part of the country. One of the professors, Markus Allgaier, noted that his work will contribute to workforce development and "untapped markets" in rural parts of the country. His work in particular focuses on using quantum features of light to create certified, secured communication networks. The grant will support the personnel, equipment and other infrastructure needed to move his work toward national security benefits.

These grants complement the North Dakota Legislature's decision to appropriate $14 million for the construction of the "National Security Corridor." Together, these investments will simultaneously advance innovation and workforce in North Dakota while further elevating national security.

From secure communication networks to workforce development, NSF-backed quantum research is becoming a cornerstone of future national security.

Cybersecurity is an all-hands-on-deck national security challenge, and NSF investments in research, infrastructure, and workforce training are essential to defending the systems Americans rely on every day.

National Security Alarms Ringing

Nearly every system we use daily is a potential cyberattack target. *The Wall Street Journal* quoted a member of the U.S. Secret Service's Cyber Fraud Task Force saying, "what's at risk are the basic needs of our country, things like the power grid, financial markets and clean water."

Multiple experts were interviewed for this article who raised their red flags high on the flagpole. A former deputy director of the CIA said that while reassessing to avoid overlapping efforts is beneficial, "this is an all-hands-on-deck moment" when it comes to making sure the U. S. can fight emerging threats. Another expert at *Issue One* noted, "It's not a question of if a major adversary-driven attack will hit, but when."

NSF has supported cybersecurity advances not only through research and infrastructure, but also through education and training. Projects focused on hardware, software, networks and data management all have benefited from NSF support. Likewise, NSF has made investments in research and training programs from community colleges to four-year universities. Both are necessary to keep the nation safe. As one senior cybersecurity expert noted, "we can't expect a local water utility to defend itself against attacks from China without support."

Sounding the Bioterrorism Alarm

A report in the *Indiana Daily Student* warns that now, twenty-five years after anthrax spores were mailed to the Hart Senate Office Building, funding cuts are eroding the nation's biological shield. Dr. Henry Heine, a former researcher at the U.S. Army Medical Research Institute for Infectious Diseases now at the University of Florida, stated that the U.S. response capability "has been dismantled".

Heine revealed that funding freezes halted his team's pre-clinical trials for an antibiotic effective against three bacterial species with high bioterrorism potential. He warned that unlike complex nuclear tech, biological threats are the "poor man's weapon of mass destruction" because they can be cultivated in a simple kitchen.

Dr. Julia van Kessel at Indiana University, whose cholera research depends on NSF support, emphasized that defense relies on broad scientific inquiry. She noted that obscure findings in immunology often provide the unexpected keys to stopping new threats, concluding: "if the COVID pandemic didn't teach them that, I'd shudder to think what will".

KEY TAKEAWAYS

- NSF investments form the scientific bedrock of national defense, generating the essential capabilities that power modern military systems.
- Critical assets, from leading-edge weapons and laser guidance to AI-driven intelligence, emerged directly from long-term, curiosity-driven NSF research.
- National security now encompasses domestic resilience, relying on NSF-funded breakthroughs to secure critical infrastructure, food systems, and public health.
- Retreating from fundamental research risks ceding leadership in defining technologies, such as quantum and biotechnology, to strategic competitors.
- Ensuring U.S. safety and strategic advantage requires sustained support for the scientific innovation that keeps America ahead of emerging threats.

Conclusion

This analysis of 3,800 articles and broadcast segments finds significant coverage of the NSF's essential role in national security. Coverage emphasizes that U.S. military superiority relies on "blue-sky" research that explores frontiers that defense contracts cannot yet define. Scaling back this fundamental research is described as dismantling the nation's scientific shield while threats evolve. Critical assets, from AI-driven intelligence to pathogen detection, began as broad scientific inquiry long before becoming operational tools.

The path from the lab bench to the battlefield is a critical pipeline for readiness. Media coverage highlights NSF's unique role in providing the raw materials for future defense capabilities. Consequently, there is widespread concern that underinvestment risks unilateral disarmament amid rising competition (Shivakumar & Heng, 2025). NSF research is portrayed not merely as science policy, but as a strategic imperative for keeping American troops and citizens safe.

At this pivotal moment of global instability, coverage suggests America faces a stark choice: decisively invest in the research underpinning our strength or risk ceding technological advantage to adversaries. Sustained investment in basic science today ensures America's continued security and leadership tomorrow.

References

Association of American Universities. (2025, July 23). *Federal research cuts threaten U.S. innovation and leadership.* https://www.aau.edu/key-issues/federal-research-cuts-threaten-us-innovation-and-leadership/

Banish, J. (2025, January 16). *UND professors receive NSF funding for national security research. UND Today.* https://blogs.und.edu/und-today/2025/01/und-professors-receive-nsf-funding-for-national-security-research/

Borges, C. (2025, July 23). *Cuts to federal R&D funding undermine U.S. national security.* Center for Strategic and International Studies. https://www.csis.org/analysis/cuts-federal-rd-funding-undermine-us-national-security

Council on Foreign Relations. (2024). *Innovation and national security: Keeping our edge—Findings*. Council on Foreign Relations. https://www.cfr.org/task-force-report/innovation-national-security-keeping-our-edge/findings

Draisey, B. (2025, January 24). *Iowa State University receives grant for cybersecurity scholarships. Iowa Capital Dispatch.* https://iowacapitaldispatch.com/briefs/iowa-state-university-receives-grant-for-cybersecurity-scholarships/

Freifeld, K., & Chiacu, D. (2025, February 25). *Former U.S. security officials say funding federal science research critical to race with China*. *Reuters*. https://www.reuters.com/world/former-us-security-officials-say-funding-federal-science-research-critical-race-2025-02-25/

Harvard Medicine Magazine. (2013). *A brief history of federal funding for basic science*. Harvard Medical School. https://magazine.hms.harvard.edu/articles/brief-history-federal-funding-basic-science

JSTOR Daily. (2019). *Science in war, science in peace: The origins of the NSF*. https://daily.jstor.org/science-in-war-science-in-peace-the-origins-of-the-nsf/

Kendall, F. (2025, July 24). *By cutting science, the Defense Department is eating its seed corn*. *Defense News*. https://www.defensenews.com/opinion/2025/07/24/by-cutting-science-the-defense-department-is-eating-its-seed-corn/

Loten, A. (2025, October 10). *Federal cyber cuts raise national security alarms. The Wall Street Journal.* https://www.wsj.com/articles/federal-cyber-cuts-raise-national-security-alarms-29e0fc7f

National Academies of Sciences, Engineering, and Medicine. (1999). *Funding a revolution: Government support for computing research* (Chap. 6). National Academies Press. https://www.nationalacademies.org/read/6323/chapter/6

National Science Board. (2025, May 16). *Winning the race for the future with the National Science Foundation*. National Science Foundation. https://www.nsf.gov/nsb/updates/nsf-anniversary-statement

National Science Foundation. (1950). *National Science Foundation Act of 1950* (Pub. L. No. 81-507). (as cited in National Science Foundation, 2017)

National Science Foundation. (n.d.). *History – About NSF*. https://www.nsf.gov/about/history

National Science Foundation. (2015, June 18). *On the road to ubiquity.* https://www.nsf.gov/news/road-ubiquity

National WWII Museum. (n.d.). *The scientific and technological advances of World War II*. https://www.nationalww2museum.org/war/articles/scientific-and-technological-advances-world-war-ii

Polk, M., & Jyotishi, S. (2025, May 2). *NSF funding is key to the biotechnology workforce—and national security*. New America. https://www.newamerica.org/education-policy/edcentral/nsf-funding-is-key-to-workforce-and-national-security/

Ronald Reagan Presidential Foundation & Institute. (2025, December 3). *Reagan National Defense Survey.* https://www.reaganfoundation.org/reagan-institute/centers/peace-through-strength/survey/2025-reagan-national-defense-survey

Schaberg, S. (2026, January 21). *Opinion: Federal cuts to biological research funding threaten national security. Indiana Daily Student.* https://www.idsnews.com/article/2026/01/opinion-federal-cuts-funding-biology-national-security-iu-bloomington-indiana

Shivakumar, S., & Heng, J. (2025, May 1). *The NSF is a key national security pillar—Now is not the time to disarm.* Center for Strategic and International Studies. https://www.csis.org/analysis/cuts-federal-rd-funding-undermine-us-national-security

The Science Coalition. (2025, April 30). New national poll finds strong bipartisan support for federal investments in scientific research. https://www.sciencecoalition.org/2025/04/30/national-poll/

Thompson, J. (2025, June 6). *Federal cuts to science and research threaten our prosperity and national security. Bangor Daily News.* https://www.bangordailynews.com/2025/06/06/opinion/federal-cuts-to-science-and-research-threaten-our-prosperity-and-national-security-joam40zk0w/

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About the Study Group

The Study Group exists to advance the best of artificial intelligence, assessment, and data practice, technology, and policy; uncover future design needs and opportunities for educational systems; and generate recommendations to better meet the needs of students, families, and educators.

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