CENTER FOR SPACE POLICY AND STRATEGY

ISSUE BRIEF | SEPTEMBER 2025

HOW NEPA APPLIES TO U.S. SPACE ACTIVITIES

Lindsay DeMarchi

Historically, there have been few examples in which the National Environmental Policy Act, or NEPA, has been directly applied to space activity. Two recent executive orders have called on U.S. federal agencies to review how NEPA applies in this context. This primer reviews the NEPA process and provides a brief overview of historical and present intersections of NEPA with U.S. public and private space activities.

Introduction

A frequently ambiguous aspect of U.S. oversight of space is the application of existing environmental law to national space activities. Signed by President Richard Nixon in 1970 after an almost-unanimous passage through Congress in 1969, the National Environmental Policy Act (NEPA) provides a procedure for evaluating proposed federal actions that stand to significantly affect the quality of Earth's environment.[1,2] Over time, the applicability of NEPA to space activities has emerged through individual agency interpretations and court cases (see Figure 1 on the next page). Absent the authority of a single space-related regulatory body, each agency determines which actions warrant a NEPA assessment.

In January 2025, the Trump Administration published Executive Order 14154, which called upon the Council of Environmental Quality (CEQ) to revisit its regulatory authority over NEPA implementation.[3,4,5] In February 2025, the CEQ issued an interim final rule and memorandum that removed its regulatory authority and directed federal agencies to evaluate and publish their own NEPA implementations within the next year.[6] In August 2025, the Trump Administration published Executive Order 14335, *Enabling Competition in the Commercial Space Industry,* which (among other topics) provides internal executive branch interpretation and direction to agencies on how to implement NEPA for space activities. These three events signal a growing debate about the role NEPA should (or should *not*) play in U.S. oversight of space activities going forward. To help inform this discussion and debate, this issue brief provides an overview of what NEPA is and how it is currently applied to U.S. space activities.

AEROSPACE

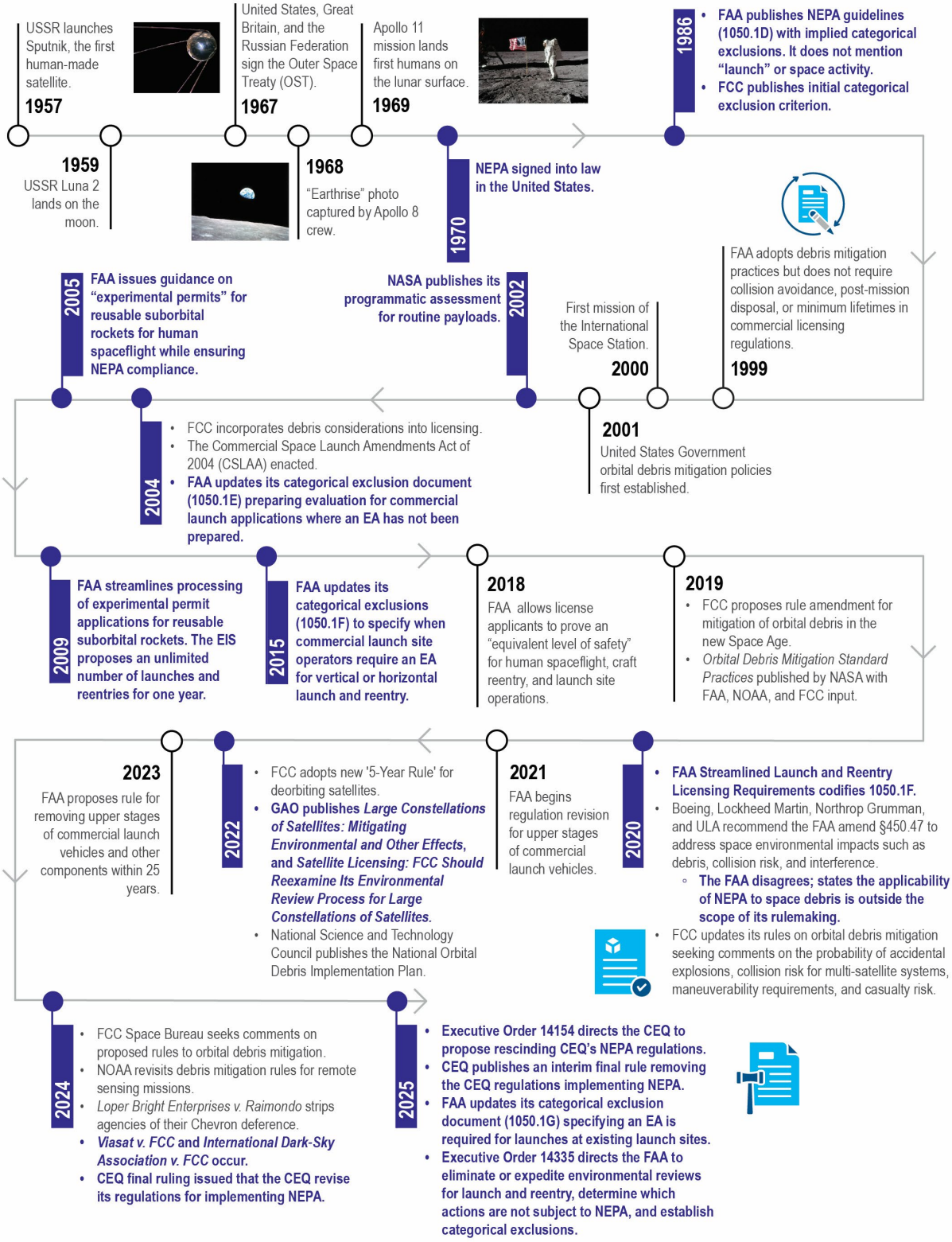
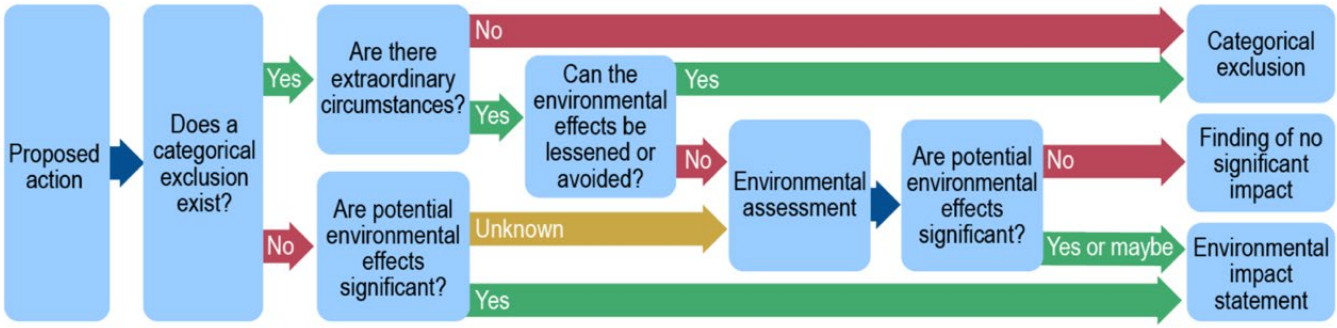


Figure 1. A timeline spanning the dawn of the Space Age to present day, highlighting NEPA-related benchmarks (purple) and agency activity related to human behaviors in the space environment including launch, debris, and prolonged occupation.

How NEPA Works. Often mistaken for regulation, NEPA is a *framework*—a procedure for preparing documents that demonstrate economic, social, and environmental compliance with the Clean Air Act, Clean Water Act, National Historic Preservation Act, and the Endangered Species Act, among others.[7, 8, 9] Thus, a NEPA assessment presents a reasonable range of economically feasible alternatives to a proposed agency action, including *not* implementing the proposed action (known as a "no-action" alternative).

The Council on Environmental Quality (CEQ), operating under the Executive Office of the President, was—until recently—the *regulatory element* of NEPA. The CEQ was assigned its regulatory authority in 1979 by President Carter through Executive Order (EO) 11991.[10] In January 2025, the Trump Administration issued Executive Order 14154, which directed the CEQ to propose repealing its own NEPA regulations, rescinded EO 11991, and ordered the CEQ to provide further guidance on how NEPA should be implemented.[11,12,13] In its interim final rule, the CEQ removed its regulations, and therefore its regulatory authority, from the federal code.[14, 15] Despite this change, NEPA continues to serve as a streamlining framework and federal agencies are directed to create their own regulations to implement NEPA within the next year.[16, 17]

Any agency considering a large federal action* can lead a NEPA review, and each agency has its own criteria of "categorical exclusions"—actions that are exempt from NEPA review because they are predetermined to have no significant or adverse impact on the human environment. In 1986, both the Federal Aviation Administration (FAA) and the Federal Communications Commission (FCC) published their lists of categorical exclusions and have updated them since (see Figure 1 and relevant sections in Figure 2 below).



Source: GAO analysis of NEPA and Council on Environmental Quality's implementing regulations. | GAO-23-105005

Figure 2. Reproduced workflow from a 2022 GAO report determining what level of document must be prepared as a NEPA review. Reproduced workflow from a 2022 GAO report determining what level of document must be prepared as a NEPA review[18].

*A proposed action describes an event to take place. The Fiscal Responsibility Act of 2023 clarifies "subject to substantial federal control and responsibility" as determined by the agency. The working definition of "event" refers to launch (FAA) or satellite operation (FCC), which can be licensed per rate (FAA) or per system (FCC) rather than per an individual basis. NASA defines an "event" as "an occurrence, as specified by a type of happening and the time and place of the happening," e.g., the time and angular position of an antenna at the point of maximum elevation during a spacecraft pass. Similarly, NASA lists "events" at https://www.nasa.gov/missions/artemis/orion/artemis-i-launch-countdown-101/ that constitute a launch mission. Unfortunately, the *Cambridge Aerospace Dictionary* and the *ASTM Dictionary of Engineering Science and Technology* do not define "event."

If a proposed action does not qualify as a categorical exclusion under the agency leading the NEPA review, there are two types of environmental documents that may be prepared (see Figure 2):

- ***Environmental impact statement (EIS)***: the proposed action **has** a reasonably foreseeable, significant effect on the quality of the human environment. An EIS suggests actions to mitigate negative impacts and must be made publicly available for public participation to help inform agency decisionmaking.[19]

- ***Environmental assessment (EA):*** investigates potential environmental effects if the action **does not have** a reasonably foreseeable significant effect or if the significance of the effect is unknown.

An EA therefore may result in a "finding of no significant impact" (FONSI) or recommend a further EIS.

How NEPA Is Applied to U.S. Space Activities

The FCC and NEPA. The FCC categorically excludes, or does not require a NEPA review for, satellites operating in space.[20] Within the FCC, NEPA considerations[†] follow a narrow list of effects and little explanation is provided for outstanding circumstances.[21, 22] In 2022, the U.S. Government Accountability Office (GAO) concluded the FCC should revisit its categorical exclusions for satellites, supported by public concern.[23] The FCC ruled in 2022 as an interpretation of the "public interest" that it would recommend satellites de-orbit within 5 years of mission end, shortening the original 25-year suggestion, as a manner of avoiding the creation of further space debris (see Figure 1). This decision was not based on NEPA or the creation of an environmental impact statement or assessment.

In compliance with guidance from the CEQ following the issuance of EO 14154 in January 2025, the FCC published in August 2025 a Notice of Proposed Rulemaking (NPRM) to collect feedback on streamlining NEPA procedures, such as clarifying what constitutes a major federal action,[‡] further clarification of compliance with the National Historic Preservation Act, and if the FCC should "retain its current approach of applying a broad categorical exclusion to major federal actions (MFAs), or whether to adjust its categorical exclusion framework to list specific MFAs that would be categorically excluded."[24] The latter applies to satellite licensing and in-space activity directly, welcomes discussion as to which space-related activities should constitute an MFA, and solicits advice regarding "space-based operations that take place within U.S. jurisdiction and otherwise subject to NEPA."[25] The notice further requests input on how the FCC may streamline NEPA within the agency by establishing an EA submission deadline and a timeframe for action in response to EAs.[26]

The FAA and NEPA. Before issuing a launch or reentry license, the FAA conducts an environmental review to evaluate public safety, payloads, and anticipated environmental effects.[27, 28] As such, the review focuses primarily on rocket launch emissions and orbital debris. The debris analyses gauges if the launch or *purposeful*[§] object reentry will maintain safe distances from other objects,[29] and minimizes the probability of collision with orbital debris, active satellites, or human space flight.

The FAA Office of Commercial Space Transportation (AST) follows specific guidelines outlined in FAA Order 1050.1 to determine when a launch might be categorically excluded from a detailed NEPA assessment. While the FAA does **not** currently have a categorical exclusion for rocket launches,[30] evaluations often result in a FONSI.

[†] The considerations are located at https://www.ecfr.gov/current/title-47/chapter-i/subchapter-A/part-1/section-1.1307#p-1.1307(a), *actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared*; and interpreted as related to satellites at https://ehtrust.org/question-and-answers-on-the-fcc-nepa-process/ *Questions and Answers on the FCC NEPA Process—Environmental Health Trust.*
[‡] See Footnote *.
[§] According to GAO-23-105005, the FAA has no jurisdiction over the planned or unplanned reentry of a satellite once it has separated from the launch vehicle. Consequently, the FAA does not assess debris or emissions from reentering satellites.

Executive Order 14335 (issued August 13, 2025) instructs the Secretary of Transportation to "use all available authorities to eliminate or expedite the Department of Transportation's environmental reviews for, and other obstacles to the granting of, launch and reentry licenses and permits." This could include creating new or expanded categorical exclusions.

As a means of streamlining proposed missions that are similar to past applications, the FAA or other lead agencies conducting a NEPA review may cite preexisting analyses without needing to issue a new review, or opt to focus on elements that differ from the original.[31] For example, a NASA programmatic assessment from 2002[32] for routine payloads served as the basis of evaluations performed in 2011[33] and 2024.[34]

Other Space-Related Agencies and NEPA. Absent a centralized space-regulatory agency, most decisions regarding the environmental impact of space-related activity fall primarily within the FCC, which licenses radio spectrum use, and the FAA, which licenses launch and reentry. Missions to planetary bodies or launches that are entirely security-related may result in NASA- or Department of Defense- led NEPA reviews.[35, 36, 37] The GAO summarizes departments' interfaces with environmental effects from large commercial satellite constellations in Figure 3 of its 2022 report.[38]

While not a regulatory agency, NASA, as an agency conducing space activities, performed a NEPA review for the International Space Station that resulted in an EIS. The EIS evaluated the health and safety of onboard individuals and examined the consequences of materials returning to Earth.[39] In particular, the in-space operations of the ISS were analyzed to ensure "environmental health monitoring of air, water quality, microbiological levels, noise and radiation to ensure crew health and safety is provided in the ISS design." The report further clarifies that while in-space, "environmental control and life support systems will collect waste products (metabolic waste, food, packaging, regenerative process effluents, hard copy waste, etc.) and process them for on-board conversion to useful products or return to Earth. "

Acknowledgments

The author would like to acknowledge Karen Jones and Christine (Chris) Ponte for their expertise and thorough research into the background of this subject and Colleen Stover for her suggested improvements. The author would like to thank Jacob Bain for his creative acumen in creating Figure 1 and Denise Betts for formatting of this paper.

About the Author

Dr. Lindsay DeMarchi is a policy analyst in the Center for Space Policy and Strategy at The Aerospace Corporation. Her expertise centers around civil space, interests of the public good, and related intersections and opportunities in a burgeoning commercial space sector. Prior to joining Aerospace, DeMarchi was a congressional fellow in the United States Senate covering space, transportation, and natural resource policy topics. She led the development of legislation on space launch licensing, space debris, light pollution from satellites, and commercial low Earth orbit (LEO) destinations. DeMarchi earned a bachelor's degree in physics and astronomy from Colgate University, a master's degree in physics from Syracuse University, and a master's degree and doctorate in astronomy from Northwestern University.

About the Center for Space Policy and Strategy

The Center for Space Policy and Strategy is dedicated to shaping the future by providing nonpartisan research and strategic analysis to decisionmakers. The Center is part of The Aerospace Corporation, a nonprofit organization that advises the government on complex space enterprise and systems engineering problems.

The views expressed in this publication are solely those of the author(s), and do not necessarily reflect those of The Aerospace Corporation, its management, or its customers.

For more information, go to www.aerospace.org/policy or email policy@aero.org.

References

[1] Council on Environmental Quality. "Home." CEQ.doe.gov. U.S. Government, Accessed March 1, 2025, https://ceq.doe.gov/.

[2] Council on Environmental Quality. "Home." CEQ.doe.gov. U.S. Government, Accessed March 1, 2025, https://ceq.doe.gov/.

[3] "Removal of National Environmental Policy Act Implementing Regulations." *Federal Register,* 25 February 2025, https://www.federalregister.gov/documents/2025/02/25/2025-03014/removal-of-national-environmental-policy-act-implementing-regulations.

[4] Scarlett, Katherine R. "Implementation of NEPA." Council on Environmental Quality, 19 February 2025, https://ceq.doe.gov/docs/ceq-regulations-and-guidance/CEQ-Memo-Implementation-of-NEPA-02.19.2025.pdf.

[5] Council on Environmental Quality. "CEQ NEPA Rulemaking." CEQ.doe.gov, Accessed March 1, 2025, https://ceq.doe.gov/laws-regulations/regulations.html.

[6] *Memorandum on NEPA Implementation*, (Feb. 19, 2025), https://ceq.doe.gov/docs/ceq-regulations-and-guidance/CEQ-Memo-Implementation-of-NEPA-02.19.2025.pdf.

[7] "Preparing Environmental Documents." Federal Energy Regulatory Commission, 3 Sept. 2008, www.ferc.gov/sites/default/files/2020-04/PreparingEnvironmentalDocuments.pdf. Accessed 3 Jul. 2025.

[8] *42 USC Chapter 55, Subchapter I: Policies and Goals,* https://uscode.house.gov/view.xhtml?hl=false&edition=prelim&req=granuleid%3AUSC-prelim-title42-chapter55-subchapter1&num=0&saved=%7CKHRpdGxlOjQyIHNlY3Rpb246NDMyMSBlZGl0aW9uOnByZWxpbSk%3D%7C%7C%7C0%7Cfalse%7Cprelim.

[9] United States Environmental Protection Agency. "National Environmental Policy Act Review Process." EPA.gov, 11 April 2025, https://www.epa.gov/nepa/national-environmental-policy-act-review-process.

[10] Environmental Protections. *Federal Register,* 25 May 1977, https://www.federalregister.gov/executive-order/11991.

[11] "Removal of National Environmental Policy Act Implementing Regulations." *Federal Register,* 25 February 2025, https://www.federalregister.gov/documents/2025/02/25/2025-03014/removal-of-national-environmental-policy-act-implementing-regulations.

[12] Scarlett, Katherine R. "Implementation of NEPA." Council on Environmental Quality, 19 February 2025, https://ceq.doe.gov/docs/ceq-regulations-and-guidance/CEQ-Memo-Implementation-of-NEPA-02.19.2025.pdf.

[13] Council on Environmental Quality. "CEQ NEPA Rulemaking." CEQ.doe.gov, Accessed March 1, 2025, https://ceq.doe.gov/laws-regulations/regulations.html.

[14] Scarlett, Katherine R. "Implementation of NEPA." Council on Environmental Quality, 19 February 2025, https://ceq.doe.gov/docs/ceq-regulations-and-guidance/CEQ-Memo-Implementation-of-NEPA-02.19.2025.pdf.

[15] Council on Environmental Quality. "CEQ NEPA Rulemaking." CEQ.doe.gov, Accessed March 1, 2025, https://ceq.doe.gov/laws-regulations/regulations.html.

[16] "Council on Environmental Quality Withdraws NEPA Regulations and Issues Interim Guidance to Agencies." Crowell & Moring LLP, 21 February 2025, https://www.crowell.com/en/insights/client-alerts/council-on-environmental-quality-withdraws-nepa-regulations-and-issues-interim-guidance-to-agencies.

[17] *Memorandum on NEPA Implementation*, (Feb. 19, 2025), https://ceq.doe.gov/docs/ceq-regulations-and-guidance/CEQ-Memo-Implementation-of-NEPA-02.19.2025.pdf.

[18] United States Government Accountability Office. "FCC Should Reexamine Its Environmental Review Process for Large Constellations of Satellites." Page 10. November 2022, https://www.gao.gov/assets/gao-23-105005.pdf.

[19] Council on Environmental Quality. "A Citizen's Guide to the NEPA," 12 Dec. 2007, ceq.doe.gov/docs/get-involved/ceq.doe.gov/docs/get-involved/citizens_guide_dec07.pdf. Accessed 3 July 2025.

[20] Ryan, Ramon J. "The Fault in Our Stars: Challenging the FCC's Treatment of Commercial Satellites as Categorically Excluded from Review Under the National Environmental Policy Act." *Vanderbilt Journal of Entertainment & Technology Law,* Vol. 22, No. 4, May 2020, pp. 923-25, https://scholarship.law.vanderbilt.edu/jetlaw/vol22/iss4/8/.

[21] "Questions and Answers on the FCC NEPA Process." *Environmental Health Trust,* https://ehtrust.org/question-and-answers-on-the-fcc-nepa-process/. Accessed March 1, 2025.

[22] Rosenberg, Erica. "What the FCC Must Do to Comply with New NEPA Rules." *Public Employees for Environmental Responsibility,* 10 June 2024, https://peer.org/commentary-what-the-fcc-must-do-to-comply-with-new-nepa-rules/.

[23] Pultarova, Tereza. "Forty-Year-Old Loophole Exempts Satellite Pollution from Regulations." *Supercluster*, 5 Nov. 2024, https://www.supercluster.com/editorial/forty-year-old-loophole-exempts-satellite-pollution-from-regulations.

[24] Federal Communications Commission. "Modernizing the Commission's National Environmental Policy Act Rules." July 17 2024, https://docs.fcc.gov/public/attachments/DOC-413047A1.pdf.

[25] Federal Communications Commission, "Modernizing the Commission's National Environmental Policy Act Rules." Notice of Proposed Rulemaking, WT Docket No. 25-217 (July 17, 2025), https://docs.fcc.gov/public/attachments/DOC-413047A1.pdf.

[26] Federal Communications Commission, "Modernizing the Commission's National Environmental Policy Act Rules." Notice of Proposed Rulemaking – WT Docket No. 25-217 (July 17, 2025), https://docs.fcc.gov/public/attachments/DOC-413047A1.pdf.

[27] "14 CFR § 450.47" eCFR.gov. *Electronic Code of Federal Regulations,* accessed January 1, 2025, https://www.ecfr.gov/current/title-14/chapter-III/subchapter-C/part-450/subpart-B/section-450.47.
[28] "14 CFR § 450.101" eCFR.gov. *Electronic Code of Federal Regulations,* accessed January 1, 2025, https://www.ecfr.gov/current/title-14/chapter-III/subchapter-C/part-450/subpart-C/section-450.101.
[29] "14 CFR § 450.169." eCFR.gov. Electronic Code of Federal Regulations, accessed January 1, 2025, https://www.ecfr.gov/current/title-14/chapter-III/subchapter-C/part-450/subpart-C/section-450.169
[30] United States Government Accountability Office. "How FAA Considers Environmental and Airspace Effects." April 2024, https://www.gao.gov/assets/gao-24-106193.pdf.
[31] United States Government Accountability Office. "FCC Should Reexamine Its Environmental Review Process for Large Constellations of Satellites." November 2022, https://www.gao.gov/assets/gao-23-105005.pdf.
[32] "National Environmental Policy Act; Final Environmental Assessment for Launch of NASA Routine Payloads on Expendable Launch Vehicles from Cape Canaveral Air Force Station Florida and Vandenberg Air Force Base California." *Federal Register,* 18 June 2002, https://www.federalregister.gov/documents/2002/06/18/02-15348/national-environmental-policy-act-final-environmental-assessment-for-launch-of-nasa-routine-payloads.
[33] NASA. "Environmental Assessment for Launch of NASA Routine Payloads." NASA, January 2024, https://www.nasa.gov/wp-content/uploads/2024/01/routine-payloads-ea.pdf.
[34] NASA. "Routine Payloads Finding of No Significant Impact." NASA, January 2024, https://www.nasa.gov/wp-content/uploads/2024/01/routine-payloads-fonsi.pdf.
[35] NASA. "Final Environmental Impact Statement for the Mars 2020 Mission." November 2014, p. 3-1, https://web.archive.org/web/20210318165346/https://mars.nasa.gov/mars2020/files/mep/Mars2020_Final_EIS.pdf. Accessed 13 Jun. 2025.
[36] Ellis, Michael. "Keep Environmental Red Tape Out of Outer Space." *Heritage Foundation,* 6 Aug. 2021, https://www.heritage.org/government-regulation/report/keep-environmental-red-tape-out-outer-space.
[37] NASA. "Applying the NEPA Process to NASA's Mission." NASA, https://www.nasa.gov/emd/nepa/about-nepa/. Accessed January 1, 2025.
[38] United States Government Accountability Office. "FCC Should Reexamine Its Environmental Review Process for Large Constellations of Satellites." Page 12. November 2022, https://www.gao.gov/assets/gao-23-105005.pdf.
[39] NASA. "Final Tier 2 Environmental Impact Statement for International Space Station." May 1996. https://ntrs.nasa.gov/api/citations/19960053133/downloads/19960053133.pdf.