Congressional Research Service
Informing the legislative debate since 1914

Science and Technology Issues for the 119th Congress

April 3, 2025

Congressional Research Service
https://crsreports.congress.gov
R48482

CRS REPORT
Prepared for Members and
Committees of Congress

Congressional Research Service
Informing the legislative debate since 1914

SUMMARY

R48482

April 3, 2025

Emily G. Blevins, Coordinator
Analyst in Science and Technology Policy

Marcy E. Gallo, Coordinator
Analyst in Science and Technology Policy

Science and Technology Issues for the 119th Congress

Science and technology (S&T) underlie a wide range of issues confronting the nation. The advancement of S&T drives economic growth, helps address national priorities, and improves health and quality of life. The ubiquity and constantly changing nature of S&T frequently create public policy issues of congressional interest.

The federal government supports the advancement of S&T. Financial support of research and development (R&D) has led to scientific breakthroughs and new technologies, ranging from jet aircraft and the internet to communications satellites and defenses against disease. Federal policies, some of which may indirectly support or limit the innovative capacity of the public and private sectors, govern many aspects of S&T activities.

This report spotlights some of the key S&T policy issues before the 119th Congress. Examples include cross-cutting subjects that affect S&T progress across a range of fields and disciplines as well as the capacity of the United States to innovate and maintain global competitiveness. The report also highlights new or rapidly developing areas of S&T that have the potential to transform current capabilities. Congress may assess the adequacy of existing policy frameworks or consider creating new ones to address these S&T issue areas, which are described briefly below.

Biotechnology and Biomedical Research

Recent advances in biotechnology and biomedical research hold the promise of longer, healthier lives and more productive industries, but they also raise policy challenges. Issues that the 119th Congress may face include laboratory biosafety and biosecurity, federal regulation of laboratory-developed diagnostic devices, the federal response to emerging pathogens such as H5N1 avian influenza, and the regulation of agricultural biotechnologies.

Climate Science

S&T considerations permeate deliberations on topics related to climate change and mitigation approaches. Issues before the 119th Congress may include understanding the causes of extreme heat and addressing associated risks, assessing the concept of "net-zero emissions" and related policies, and evaluating ocean-based strategies for carbon dioxide removal.

Earth and Environmental Sciences

Earth- and environmental-science-related issues before the 119th Congress include the National Oceanic and Atmospheric Administration's (NOAA's) R&D activities, which are aimed at improving extreme weather forecasting, addressing plastic pollution, assessing the potential for seabed deposits to serve as a source of critical minerals, and understanding technologies proposed to curb illegal, unreported, and unregulated fishing.

Federal R&D

The federal government provides billions of R&D dollars annually to institutions of higher education, federal laboratories, and the private sector. The 119th Congress may consider issues related to federally funded R&D, including support for agricultural research, research security, potential reform of the National Institutes of Health, S&T cooperation with the People's Republic of China, and potential reauthorization of the Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR) programs.

Information Technology and Social Media

Rapid advancements in information technologies present several issues for the 119th Congress, such as the accessibility of various types of data by consumers, companies, and law enforcement entities (among others); cybersecurity; legal and policy considerations related to the ownership and use of social media platforms; and the potential impact of certain digital advertising and internet media strategies on traditional newspaper publishers and journalists.

Innovation and Competition

The state of America's innovation ecosystem—the constellation of people, institutions, and enterprises engaged in research and the development of new products and services—is of concern for the long-term economic and national security of the United States. Selected innovation- and competition-related issues that the 119th Congress may face include overseeing advances and new commercial applications of artificial intelligence, advancing innovation at the Department of Defense, overseeing the implementation of regional innovation strategies, considering the role of patents in promoting innovation and competition, and examining the role of immigration in the U.S. S&T workforce.

Telecommunications

Telecommunications technologies present several issues for policymakers, including over-the-air radio broadcast transmissions (such as access to transmissions and the impact of broadcasting technologies on copyright), policies governing federal and nonfederal radio spectrum management and use, and the security and resiliency of telecommunication networks.

Contents

Contacts

Introduction

The federal science and technology (S&T) policymaking enterprise consists of an extensive and diverse set of stakeholders in the executive, legislative, and judicial branches. The enterprise fosters, among other things, the advancement of scientific and technical knowledge; science, technology, engineering, and mathematics (STEM) education; the application of S&T to achieve economic, national security, and other societal benefits; and the use of S&T to improve federal decisionmaking.

Federal responsibilities for S&T policymaking are highly decentralized. Many House and Senate committees have jurisdiction over important elements of S&T policy. Congressional appropriations committees, for example, provide funding for federal agency S&T programs. Congress also enacts laws to establish, refine, and eliminate federal agencies, programs, policies, regulations, and regulatory processes that affect science, technology, and engineering research and development (R&D) or rely on S&T data and analysis. In addition, dozens of informal congressional caucuses exist in areas of S&T policy such as R&D, specific S&T disciplines, and STEM education.

The President formulates annual budgets, policies, and programs for consideration by Congress; issues executive orders (E.O.s) and directives; and directs the executive branch departments and agencies responsible for implementing S&T policies and programs. The Office of Science and Technology Policy (OSTP), in the Executive Office of the President, advises the President and other Administration officials on S&T issues.

Executive agency S&T responsibilities are diffuse. Some agencies, such as the National Science Foundation (NSF), have broad S&T responsibilities. Others use S&T to meet a specific federal mission (e.g., defense, energy, health, space). Regulatory agencies have S&T responsibilities in areas such as nuclear energy, food and drug safety, and environmental protection.

Federal court cases and decisions often affect U.S. S&T policy. Decisions can have an impact on the development of S&T (e.g., decisions regarding the U.S. patent system), S&T-intensive industries (e.g., the breakup of AT&T in the 1980s), and the admissibility of S&T-related evidence (e.g., DNA samples) in court.

CRS experts have identified the issues highlighted below as particularly relevant to the 119th Congress. Each section serves as a brief introduction to the topic and identifies other CRS products and the appropriate CRS experts to contact for further information and analysis.

Biotechnology and Biomedical Research

Recent advances in biotechnology and biomedical research hold the promise of longer, healthier lives and more productive industries, but they also raise policy challenges. This section discusses issues that the 119th Congress may face in this area, including laboratory biosafety and biosecurity, federal regulation of laboratory-developed diagnostic devices, the federal response to emerging pathogens such as H5N1 influenza, and the regulation of agricultural biotechnologies.

Congressional Oversight of Laboratory Biosafety and Biosecurity

In the United States, oversight of the life sciences, particularly laboratory biosafety and biosecurity, is exercised pursuant to a mixture of federal law, federal guidance, and self-governance. It is also dependent on the types of experiments and biological agents being used.

There currently is no overarching federal law that provides oversight of laboratory biosafety and biosecurity with enforceable standards and legal penalties beyond those in the Federal Select Agent Program, which covers only certain types of biological agents and toxins. Privately funded research is generally not covered by federal policy or agency guidance. In May 2024, OSTP released the *United States Government Policy for Oversight of Dual Use Research of Concern and Pathogens with Enhanced Pandemic Potential* (2024 policy). The 2024 policy addresses oversight of research on biological agents and toxins that, when enhanced, may pose risks to public health, agriculture, food security, economic security, or national security. The 2024 policy is scheduled to go into effect on May 6, 2025.

During the 118th Congress, multiple bills were introduced related to laboratory biosafety and biosecurity, pandemic prevention and preparedness, and other mechanisms to control materials and technologies related to biotechnology and other life sciences. The 119th Congress may consider several issues related to the safety and security of certain biological research. For example, Congress may consider whether or how the implementation of the 2024 policy addresses biosafety and biosecurity concerns about certain types of research or whether additional oversight mechanisms or approval processes are needed. The 119th Congress may also consider its current oversight role, including weighing whether certain types of research should be supported with federal investments and, if so, at what level.

For Further Information

Todd Kuiken, Analyst in Science and Technology Policy

CRS In Focus IF12883, *Mirror Life: Biosafety/Biosecurity Oversight Considerations*

CRS Report R47114, *Oversight of Gain-of-Function Research with Pathogens: Issues for Congress*

Food and Drug Administration (FDA) Regulation of Laboratory-Developed Tests (LDTs)

Debate over regulation of LDTs has been ongoing for three decades, underscored most recently by the development of tests during the COVID-19 pandemic. The FDA defines *LDT*s as a class of in vitro diagnostic (IVD) devices that are designed, manufactured, and used within a single laboratory. These tests are often developed and used in the context of evolving scientific knowledge and increasingly integrate complex technology. The FDA maintains that it has regulatory authority over LDTs but has traditionally not exercised that discretion broadly, so most LDTs have not been subject to premarket review or other regulatory requirements. However, the FDA has asserted authority over tests it considers higher risk, for example, direct-to-consumer tests or tests intended for emergencies. The FDA published draft guidance to regulate LDTs in 2014, but the guidance was not finalized. Many stakeholders suggested at the time that the FDA should proceed instead through notice-and-comment rulemaking, and others suggested that the agency should defer to Congress to pass legislation regulating these tests.

The Verifying Accurate, Leading-Edge, IVCT Development (VALID) Act of 2023 (H.R. 2369), introduced in the 118th Congress, proposed a comprehensive risk-based regulatory framework for "in vitro clinical tests," defined to include IVDs and LDTs, that would be distinct from the current regulatory framework for medical devices. However, no action beyond introduction was taken in the 118th Congress.

In the absence of congressional action, the FDA published a final rule in May 2024 to phase out its general enforcement discretion approach for LDTs. The 119th Congress may be interested in

revisiting the VALID Act or similar legislative proposals in light of the FDA's final rule, or it may consider oversight or other action to modify the rule's implementation.

For Further Information

Amanda K. Sarata, Specialist in Health Policy

CRS In Focus IF11389, *FDA Regulation of Laboratory-Developed Tests (LDTs)*

Federal Government's Role and Response to H5N1 Avian Influenza and Other Emerging Pathogens

Avian influenza viruses are classified as either low or highly pathogenic depending on the severity of the disease they cause in poultry and other bird species. H5N1 is a subtype of highly pathogenic avian influenza (HPAI) virus. HPAI H5N1 was first detected in 1996 in the Guangdong Province of the People's Republic of China (PRC, or China) and has been responsible for several outbreaks around the world since then. Wild birds, mainly waterfowl, have introduced the virus to new regions, where it has spread to other birds and mammals, such as dairy cattle. Several cases of humans infected with H5N1 were reported in 2024 and 2025. Most of these cases were associated with dairy and poultry workers who contracted the disease from infected animals, although a few human cases have no known connection with the dairy and poultry industry. H5N1 influenza cannot efficiently spread among humans, but its continued spread among animal populations raises the risk that a strain with human pandemic potential could emerge.

Debates surrounding the origins and the government response to COVID-19—along with the recent emergence of a new H5N1 strain and its spread to dairy farms and humans—raises questions about U.S. and global pandemic prevention and preparedness strategies. The 119th Congress may consider its role in and oversight responsibilities toward the nation's biothreat response policies and programs, which include disease surveillance (e.g., of wildlife, farms, and/or people). Congress may also consider weighing the risks and benefits of certain research programs aimed at identifying and understanding pathogens, and the development and availability of medical countermeasures.

For Further Information

Lia Biondo, Analyst in Agricultural Policy

Todd Kuiken, Analyst in Science and Technology Policy

Kavya Sekar, Analyst in Health Policy

Hassan Z. Sheikh, Analyst in Health Policy

Pervaze A. Sheikh, Specialist in Natural Resources Policy

CRS Report R47114, *Oversight of Gain-of-Function Research with Pathogens: Issues for Congress*

CRS In Focus IF12895, *H5N1 Avian Influenza: The Human Health Response*

CRS In Focus IF12837, *H5N1 HPAI Continues to Spread in Dairy Herds*

CRS Report R48361, *Highly Pathogenic Avian Influenza—H5N1 Virus: CRS Experts and Points of Contact*

Regulation of Agricultural Biotechnology

New biotechnology tools, such as gene editing, and recent regulatory developments highlight ongoing debates over innovation, oversight, and agency coordination. In 2016, Congress required a national standard for labeling foods with bioengineered or genetically engineered ingredients. The U.S. Department of Agriculture (USDA) finalized its regulations in 2018, with mandatory compliance beginning in January 2022. However, in September 2022, a U.S. district court remanded two provisions to USDA that allowed QR code labeling and text message disclosure without additional on-package labeling (7 C.F.R. §§66.106 and 66.108). USDA is expected to revise those provisions while broader labeling requirements remain in effect.

In 2020, USDA finalized the SECURE Rule (7 C.F.R. Part 340) under the Plant Protection Act (7 U.S.C. §§7701 et seq.), which exempts certain engineered plants from regulation because of low pest risk. In November 2024, USDA updated the SECURE Rule, expanding regulatory exemptions. In December 2024, the U.S. District Court for the Northern District of California vacated the rule, prompting USDA to revert to the pre-May 2020 framework and reestablish the "Am I Regulated?" process under the 2019 version of 7 C.F.R. Part 340.

USDA has proposed transferring regulation of genetically engineered agricultural animals from the FDA. In 2021, the agencies signed a memorandum outlining collaborative frameworks for premarket evaluations and post-market monitoring. In 2024, USDA, the FDA, and the Environmental Protection Agency released a plan for regulatory reform under the Coordinated Framework for Biotechnology, focusing on modified plants, animals, and microorganisms; human drugs; and broader issues. The plan aims to clarify oversight and includes biannual reviews.

The December 2024 court decision invalidating USDA's SECURE Rule and USDA's reversion to the pre-May 2020 framework may prompt Congress to assess the implications for innovation and oversight in plant biotechnology regulation. Congress may also examine how these regulatory changes impact efforts to advance the U.S. bioeconomy, including agency coordination and biotechnology commercialization. Additionally, Congress may evaluate how these shifts affect goals such as balancing regulatory clarity, consumer safety, and market development in the biotechnology sector.

For Further Information

Eleni G. Bickell, Analyst in Agricultural Policy

CRS In Focus IF12618, *Gene-Edited Plants: Regulation and Issues for Congress*

Climate Science

S&T considerations permeate deliberations on topics related to climate change and mitigation approaches. This section discusses issues before the 119th Congress, which may include understanding the causes of extreme heat and addressing associated risks, assessing the concept of "net-zero emissions" and related policies, and evaluating ocean-based strategies for carbon dioxide removal.

Climate Change and the Challenge of Addressing Extreme Heat

According to the U.S. Global Change Research Program (USGCRP), human-caused greenhouse gas (GHG) emissions are warming the planet, and in recent years, scientists have observed record-breaking temperatures and heat waves.

Extreme heat can have a range of serious consequences on U.S. communities. It can cause heat-related deaths and an increase in heat-related medical conditions. Extreme heat affects the health, safety, and productivity of workers. According to the Centers for Disease Control and Prevention, extreme heat puts personnel at increasing risk of workplace injuries. Extreme heat also strains the electrical power grid because it creates high demand for cooling, among other reasons. It has been estimated that during the summer of 2023, about two-thirds of North America faced the potential for insufficient operating reserves of electricity from extreme heat. Extreme heat may accelerate the degradation of roads, bridges, and railroad tracks. According to the Department of Defense (DOD), extreme heat may degrade aircraft performance by reducing lift capacity, which may require payload reductions and longer takeoff distances. In addition, extreme heat puts stress on plants, livestock, and poultry, reducing agricultural yields.

Studies have examined the influence of human-caused climate change on individual extreme heat events. While not every extreme heat event is caused by climate change, some studies have found that human-caused climate change has increased the risk of certain extreme heat events in the United States. Modeling results from the Fifth National Climate Assessment of the USGCRP indicate that "it is *very likely* that heatwaves will increase in frequency, severity, and duration as warming continues."

Congress has oversight across a range of federal activities that can address extreme heat risks and events, including activities involving research, preparation, response, and mitigation. In addition to oversight, the 119th Congress may consider the level of funding for federal activities regarding extreme heat.

For Further Information

Jonathan D. Haskett, Analyst in Environmental Policy

CRS In Focus IF12733, *Extreme Heat and Climate Change*

The Net-Zero Concept and Policy Considerations

There is a scientific consensus that human-caused GHG emissions increase the levels of GHGs in the atmosphere. Higher levels of GHGs result in increases in global average temperature and a corresponding increase in global net negative climate change effects. Global temperatures are generally not expected to stabilize until after GHG emissions reach net zero.

Net-zero emissions refers to a situation in which human-caused GHG emissions, from sources such as fossil fuel combustion and deforestation, are fully balanced by removal of carbon dioxide from the atmosphere. Methods of removal include natural absorption and storage in forests and other ecosystems as well as technological removal and storage.

The net-zero concept appears in both enacted legislation and executive branch actions. Provisions in recent legislation funded emissions reduction activities, in some cases citing the goal of achieving net-zero GHG emissions. For example, in 2022, Congress enacted P.L. 117-169, commonly known as the Inflation Reduction Act (IRA), which included appropriations of approximately $5.8 billion in financial assistance to industrial or manufacturing facilities to help them adopt "advanced industrial technology at an eligible facility." In this context, the IRA defines "advanced industrial technology" as being "designed to accelerate [GHG] emissions reduction progress to net-zero." One of the priorities for receiving the assistance is the level of emissions reductions from an industrial or manufacturing facility.

The Paris Agreement, which the United States had previously joined, is an international pact for cooperation to address climate change and its impacts. Article 4 of the agreement includes a goal

of achieving a balance between GHG emissions and removals (i.e., reaching net-zero emissions) by the second half of this century. On January 20, 2025, President Trump issued an E.O. directing the withdrawal of the United States from the Paris Agreement. The 119th Congress may examine policies and programs that seek to implement a net-zero concept.

For Further Information

Jonathan D. Haskett, Analyst in Environmental Policy

CRS In Focus IF12753, *Climate Change: What Are Net-Zero Emissions?*

Marine Carbon Dioxide Removal (mCDR)

Scientists have investigated how mCDR, including artificial upwelling/downwelling, direct ocean removal, macroalgal (seaweed) cultivation, ocean alkalinity enhancement, and ocean fertilization may augment the ocean's natural ability to absorb atmospheric carbon dioxide and to store carbon for extended periods. Various stakeholders have proposed the use of mCDR as a policy option to mitigate rising atmospheric carbon dioxide levels. The efficacy, cost, co-benefits, and risks of full-scale deployment of mCDR approaches are still uncertain. While some stakeholders propose controlled field experiments to investigate these uncertainties, permitting and high costs for conducting such experiments may present challenges for researchers.

Policy options, such as a federal regulatory framework to facilitate controlled field experiments, may elucidate some uncertainties associated with mCDR. Some stakeholders contend that a robust system for monitoring, reporting, and verifying carbon sequestration is needed to ensure transparent and effective management of mCDR projects. Such a system may use existing federal assets or new technologies supported by federal agencies to monitor the marine environment in areas where projects take place. Congress may consider how improved federal coordination on mCDR research and permitting may help identify promising approaches for carbon dioxide mitigation and other co-benefits to marine environments (e.g., ocean acidification mitigation) as well as limits to unintended side effects, including potential environmental impacts (e.g., deep-sea anoxia).

For Further Information

Caitlin Keating-Bitonti, Specialist in Natural Resources Policy

Eva Lipiec, Specialist in Natural Resource Policy

Laura Gatz, Specialist in Environmental Policy

Claire M. Jordan, Senior Research Librarian

Anthony R. Marshak, Analyst in Natural Resources Policy

CRS Report R48159, *Selected Potential Considerations with Respect to Marine Carbon Dioxide Removal: In Brief*

Earth and Environmental Sciences

Earth- and environmental-science-related issues before the 119th Congress include the National Oceanic and Atmospheric Administration's (NOAA's) R&D activities, which are aimed at improving extreme weather forecasting, addressing plastic pollution, assessing the potential for seabed deposits to serve as a source of critical minerals, and understanding technologies proposed to curb illegal, unreported, and unregulated (IUU) fishing.

Improving Extreme Weather Forecasting

Weather- and climate-related disasters impact millions of people in the United States each year and can cost billions of dollars. For example, in 2024, the United States experienced 27 weather- and climate-related events that each caused more than $1 billion in losses, according to NOAA, the primary U.S. civilian weather forecasting agency. In the United States, weather information is developed by a mix of academia, the public sector, and the private sector (e.g., commercial weather forecast providers). The public sector includes several federal agencies that engage in weather-related activities or research, have a major need for weather services, or set policy and direction for such services and research.

Congress has indicated its interest in improving aspects of weather forecasting, most recently passing the Weather Research and Forecasting Innovation Act of 2017 (commonly known as the Weather Act; P.L. 115-25). The act directed NOAA to prioritize weather research and forecasting, subseasonal and seasonal forecasting, weather satellites and data, and federal coordination of weather activities.

Since 2017, various stakeholders and practitioners have recommended additional improvements to the weather enterprise and weather research to better protect U.S. lives and property. For example, in 2022, NOAA's Science Advisory Board, a federal committee charged with advising the NOAA Administrator, recommended actions to further improve NOAA's weather-related observations, data use, forecasting, information delivery, and scientific activities, among other topics. NOAA has implemented some of these recommendations. Some Members of Congress have shown interest in improving the understanding and prediction of climate and weather-related phenomena since the passing of the Weather Act. The 119th Congress may consider previously introduced policy options, such as improvements to observations and forecasting of specific types of events (e.g., atmospheric rivers) and new authorities for weather- and climate-prediction-related activities more broadly at federal agencies. Some Members may also choose to reintroduce bills (e.g., H.R. 6093, 118th Congress) that would reauthorize or change activities authorized in the 2017 Weather Act.

For Further Information

Eva Lipiec, Specialist in Natural Resources Policy

Nicole T. Carter, Specialist in Natural Resources Policy

CRS In Focus IF12695, *Tornadoes: Background and Forecasting*

CRS In Focus IF12698, *Weather Research and Forecasting Innovation Reauthorization Act of 2023 (H.R. 6093)*

CRS In Focus IF12872, *Atmospheric Rivers: Background and Forecasting*

CRS Report R48212, *Hurricane Rapid Intensification: In Brief*

Addressing Plastic Pollution

Global and domestic plastic production has increased substantially since the mid-20th century—doubling in the last two decades alone. The durability, moldability, and versatility of plastic have led to its ubiquitous use, benefiting many aspects of society, including the food, medical, technology, textile, and transportation industries. As plastic production and use have grown, so have concerns about the impacts of plastic on the environment, including increasing rates of plastic waste generation, insufficient management of plastic waste, and pollution from plastic

waste. The potential environmental and human health effects of the chemicals used to produce plastics and the air emissions generated across the plastic life cycle have also raised concerns.

The risks from plastic pollution arise from the physical plastic particles (e.g., ingestion and entanglement by wildlife), the potential toxicity of the chemicals from which the plastics are made, and the pollutants that adhere to plastics in the environment. Other environmental impacts include air emissions generated across the plastic life cycle—including during production and for certain post-use disposal practices—which may contribute to climate change and air quality concerns. Gaps remain in understanding the magnitude and scope of these impacts and the extent to which various sources of plastic contribute to them. Observers have highlighted the importance of further research to better understand the plastic life cycle, as well as the fate, transport, and effect of plastic pollution in the environment, to inform the adoption of effective policies.

Congress has passed legislation, introduced bills, and held hearings to investigate and address various plastic-pollution-related concerns. The 119th Congress may consider adopting policy options and tools focusing on the entire life cycle of plastic or just on specific aspects of that life cycle. Many of these tools could be applied with varying levels of stringency or scope. Congress may also consider its position and options with regard to U.S. involvement in existing international agreements and ongoing negotiations related to plastic pollution.

For Further Information

Laura Gatz, Specialist in Environmental Policy

Clare Y. Cho, Specialist in Industrial Organization and Business Policy

Omar M. Hammad, Analyst in Environmental Policy

Jonathan D. Haskett, Analyst in Environmental Policy

Kristen Hite, Legislative Attorney

Angela C. Jones, Analyst in Environmental Policy

Claire M. Jordan, Senior Research Librarian

Eva Lipiec, Specialist in Natural Resource Policy

Jerry H. Yen, Analyst in Environmental Policy

CRS Report R48293, *Plastic Pollution and Policy Considerations: Frequently Asked Questions*

CRS In Focus IF12690, *International Agreement on Plastic Pollution: Negotiations*

CRS In Focus IF10967, *Marine Debris: NOAA's Role*

Seabed Deposits as a Potential Source of Critical Minerals

Demand for critical minerals for emerging technologies across multiple sectors has driven U.S. interest in securing a domestic critical mineral supply. Some stakeholders have proposed seabed mining as one option to strengthen U.S. critical mineral supply chains, because certain minerals, such as cobalt and manganese, are estimated to be more abundant in seafloor deposits than in land deposits. Tension exists, however, between the technological challenge of extracting these resources from remote, deepwater locations and the potential environmental impacts of seabed mining techniques.

Commercial-scale seabed mining for critical minerals has yet to occur in areas beyond national jurisdiction or on the U.S. outer continental shelf (OCS); however, the development of new

technologies could enable the successful extraction of minerals and may help to elucidate the relative risks and benefits of commercial-scale seabed mining. For example, new deep-sea sensing technologies may provide information about sediment disturbance and redistribution, among other environmental concerns associated with seabed mining. Seabed mineral collection equipment and machinery could be designed to minimize environmental impacts. The Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E) supports transformational energy technology research projects and has funded several related to seabed mining. Congress may consider funding levels for certain federal agencies (e.g., ARPA-E) that support R&D related to seabed mining technologies, as well as funding levels for agencies, such as the Bureau of Ocean Energy Management (BOEM), NOAA, and the U.S. Geological Survey (USGS), that work to identify the locations and characteristics of mineral deposits on the OCS. In addition, BOEM, NOAA, and the USGS have been collaborating to study the long-term environmental impacts and ecosystem recovery of an area of the OCS (Blake Plateau) disturbed during a 1970s seabed mining pilot project.

For Further Information

Caitlin Keating-Bitonti, Specialist in Natural Resources Policy

Laura B. Comay, Specialist in Natural Resources Policy

CRS Report R47324, *Seabed Mining in Areas Beyond National Jurisdiction: Issues for Congress*

CRS In Focus IF12608, *U.S. Interest in Seabed Mining in Areas Beyond National Jurisdiction: Brief Background and Recent Developments*

CRS Report R48302, *Critical Minerals on the U.S. Outer Continental Shelf: The Bureau of Ocean Energy Management's Role and Issues for Congress*

Technologies Proposed to Curb Illegal, Unreported, and Unregulated (IUU) Fishing

Earth's vast ocean area enables some fishing fleets to conduct IUU fishing activities undetected, which presents law-enforcement challenges for the United States and other coastal nations aiming to curb these practices. IUU fishing undermines fisheries management because it skews data on fishery populations, inhibits stock assessments, and can exacerbate overfishing. Congress continues to express interest in applying newer technologies to address IUU fishing. Widely used technologies, including the Vessel Monitoring System (VMS) and Automatic Identification System (AIS), monitor vessel location and movement, which can help identify vessels suspected of IUU fishing. Some nations and international organizations require VMS and AIS on fishing vessels of a certain size. SeaVision, developed by the U.S. Department of Transportation and U.S. Navy, uses nonclassified AIS data to display vessel movement as a web-based encrypted sharing network of maritime domain awareness information. The Navy applied machine learning technologies, a subset of artificial intelligence (AI), to SeaVision to detect anomalous vessel movement behavior (e.g., turning off a VMS, straddling the boundary of a marine protected area). These applications may improve targeted enforcement against vessels suspected of IUU fishing. Some federal agencies also have proposed applying AI to satellite-based synthetic aperture radar data—technology that can penetrate clouds and be used at night—to detect the location and movement of vessels that have turned off their VMSs and/or AISs. While Congress has given broad authority to several federal agencies to counter IUU fishing domestically and globally, some Members continue to pursue legislative options that would direct federal agencies to provide intelligence, equipment, and funding to partner nations particularly vulnerable to IUU

fishing. Congress may further consider how these resources may be integrated with fisheries management and enforcement approaches to address IUU fishing.

For Further Information

Caitlin Keating-Bitonti, Specialist in Natural Resources Policy

Anthony R. Marshak, Analyst in Natural Resources Policy

CRS Report R48215, *Illegal, Unreported, and Unregulated (IUU) Fishing: Frequently Asked Questions*

Federal R&D

The federal government provides billions of R&D dollars annually to institutions of higher education, federal laboratories, and the private sector. This section discusses issues the 119th Congress may consider that are related to federally funded R&D, including support for agricultural research, research security, potential reform of the National Institutes of Health (NIH), S&T cooperation with China, and the potential reauthorization of the Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR) programs.

Agricultural Research Funding

The USDA's Research, Education, and Economics (REE) mission area comprises four agencies: the Agricultural Research Service (ARS), the Economic Research Service (ERS), the National Agricultural Statistics Service (NASS), and the National Institute of Food and Agriculture (NIFA). In addition, the REE Office of the Chief Scientist provides leadership and coordination for research initiatives and activities across the department, ensuring alignment with USDA priorities and scientific advancements.

REE holds the primary federal responsibility for advancing and disseminating scientific knowledge related to agriculture, food systems, and natural resources. Its work spans a range of disciplines, including the biological, physical, and social sciences, to address challenges in agriculture and food security, sustainability, and rural development. USDA funds research and extension activities through its extramural research agency, NIFA, which distributes funding via two primary mechanisms: capacity grants, allocated to states using statutory formulas, and competitive grants, awarded through a peer-review process. USDA conducts intramural research through ARS, which focuses on high-priority agricultural challenges; NASS, which provides essential data on agriculture; and ERS, which delivers economic analysis to inform policy and decisionmaking.

Congress provided the REE mission area programs and activities with approximately $3.9 billion in FY2024 discretionary appropriations through the Consolidated Appropriations Act, 2024 (P.L. 118-42), and authorized approximately $130 million of mandatory funding per year through the Agriculture Improvement Act of 2018, commonly referred to as the 2018 farm bill (P.L. 115-334). USDA directs nearly half of this federal funding to states and local partners, primarily through grants.

While the 119th Congress is considering a new multiyear farm bill reauthorization, it may also consider establishing new REE programs or initiatives, revising existing efforts, or eliminating some programs. Without reauthorization or additional extensions, mandatory funding could expire for certain programs, such as the Organic Research and Extension Initiative and others without baseline funding.

For Further Information

Eleni G. Bickell, Analyst in Agricultural Policy

CRS In Focus IF12023, *Farm Bill Primer: Agricultural Research and Extension*

CRS Report R48307, *Federal Research and Development (R&D) Funding: FY2025*

Implementation of Research Security Policies

In general, U.S. policy for federally funded basic and applied research is to encourage openness, collaboration, and information sharing. Recently, U.S. officials and others have raised concerns about various efforts of foreign governments—most notably the PRC—to influence and exploit the openness of the U.S. research ecosystem. They warn that the ability of foreign strategic competitors to acquire U.S. advances in S&T, intellectual property, and talent may pose a risk to U.S. national defense and global economic competitiveness.

In response, Congress and the executive branch have taken several actions intended to maintain the benefits of an open research ecosystem while protecting it from external threats. For example, in 2019, Congress established an interagency working group to, among other tasks, develop descriptions of known and potential threats to federally funded R&D (P.L. 116-92, §1746). In 2021, President Trump issued National Security Presidential Memorandum 33 (NSPM-33), which directed federal agencies to take specific actions "to strengthen protections of United States Government-supported [R&D] against foreign government interference and exploitation." And in 2022, the Biden Administration issued guidance to federal agencies on the implementation of NSPM-33.

Together, these actions have amended existing policies and instituted new requirements in a number of areas, including (1) prohibiting certain federally funded researchers from participating in malign foreign talent recruitment programs, (2) establishing research security training and program requirements to increase threat awareness among U.S. academic researchers, (3) standardizing and strengthening requirements for U.S. researchers to disclose specified types of connections to foreign researchers and institutions, and (4) enhancing the ability of federal R&D funding agencies to share information and assess R&D funding decisions for potential security risks.

The 119th Congress may continue to monitor threats to the security of U.S. R&D, oversee the progress of ongoing efforts to address those threats, and consider additional measures that may enhance the ability of the United States to protect the results of federally funded R&D.

For Further Information

Emily G. Blevins, Analyst in Science and Technology Policy

Marcy E. Gallo, Analyst in Science and Technology Policy

CRS In Focus IF12589, *Research Security Policies: An Overview*

The National Institutes of Health (NIH) and Potential Agency Reform

NIH is the leading biomedical and health research agency of the federal government. With its over $47 billion budget in FY2024, NIH is the world's largest public health research funder and therefore has considerable influence on S&T globally. NIH comprises 27 different

semiautonomous institutes and centers (ICs), most of which oversee research programs related to specific diseases or other health and scientific topics.

In the 118th Congress, some committee leaders in both the House and Senate published reports on potential NIH reform. These reports highlighted several concerns, including that (1) NIH's peer-review process for selecting and funding research proposals may favor established scientific approaches over innovation; (2) NIH lost public trust during the COVID-19 pandemic with its associated public communication; (3) NIH lacks adequate oversight over grantees and their policy compliance, creating some security concerns; and (4) NIH's large and decentralized structure creates opportunities for research overlap and inefficiencies. To address the last concern, the chair of the House Committee on Energy and Commerce proposed restructuring and reducing NIH's 27 ICs to 15, and the House Committee on Appropriations reflected the proposed restructure in an FY2025 appropriations bill.

The House NIH reorganization proposal generated mixed reactions among stakeholders. Some agreed with the proposed changes or with the underlying intention to reform NIH. Others voiced concerns, particularly with including the new structure in the committee-reported FY2025 appropriations bill. Several stakeholder organizations argued that any proposed change to NIH's structure should be subject to an open and transparent public process. The 119th Congress also faces policy questions related to NIH's overall research priorities, how to balance NIH-supported research with private sector research, and the oversight and security of NIH-funded research. Congress may also respond to the Administration's recent policy changes, such as modifications to the amount of indirect costs NIH will support.

For Further Information

Kavya Sekar, Analyst in Health Policy

CRS Report R41705, *The National Institutes of Health (NIH): Background and Congressional Issues*

CRS Insight IN12516, *NIH Indirect Costs Policy for Research Grants: Recent Developments*

Oversight of the U.S.-China Science and Technology Cooperation Agreement (STA)

The first major agreement between the United States and the PRC, the U.S.-China STA, has facilitated joint R&D activities between the two nations since it was signed in 1979. At the time, the STA was part of a U.S. strategy to build ties with China to counter the influence of the Soviet Union. Since then, U.S. views and strategy toward China have been shifting to protect and advance U.S. interests vis-à-vis China as a strategic competitor.

On December 13, 2024, the Department of State announced that the United States and China had signed a protocol to amend and extend the STA for five years. The STA was last extended in September 2018, when it was amended to address U.S. concerns about China's approach to technology, innovation, and practices of concern (e.g., intellectual property theft, lax intellectual property enforcement, and forced technology transfer). Like other U.S. STAs, the U.S.-China STA is an umbrella agreement. It governs U.S. government S&T work with China through an estimated 30 agency-level protocols and 40 sub-agreements. Stated STA objectives include providing opportunities for cooperation in S&T fields of mutual interest "on the basis of equality, reciprocity and mutual benefit."

Advocates say the STA guides U.S. S&T work with China without mandating activity; provides access and protections for U.S. scientists in China, including in the social sciences (where access

has been more restricted); and benefits U.S. researchers by providing access to large pools of research subjects and longitudinal health studies. Opponents say China has cooperated inconsistently, restricted access to U.S. researchers, imposed data restrictions, and withheld scientific results. Opponents also caution that S&T ties with the United States have helped China develop research, technological, and industrial competencies. The STA has also provided the framework for PRC students and scholars to study in the United States, which has been central to China's S&T advances.

The STA is not a treaty requiring Senate ratification but is subject to congressional oversight. Such oversight could include (1) reconstituting reporting requirements, (2) requiring the Department of State to provide all sub-agreements and notify Congress of any future sub-agreements, (3) requiring an assessment of U.S. research work with China performed under the STA, and (4) determining whether the U.S.-China STA should be extended at the end of the current five-year term and, if so, according to what terms.

For Further Information

Karen M. Sutter, Specialist in Asian Trade and Finance

Emily G. Blevins, Analyst in Science and Technology Policy

CRS In Focus IF12510, *U.S.-China Science and Technology Cooperation Agreement*

Reauthorization of the Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR) Programs

Congress has a long-standing interest in federal programs that provide assistance and support for small businesses because of their perceived importance to the economy—creating jobs, improving productivity, and advancing innovation. The SBIR and STTR programs provide early-stage R&D funding to small businesses with the intent of stimulating innovation, expanding the use of these businesses to help meet federal R&D needs, and increasing private sector commercialization of innovations resulting from federally funded R&D, among other goals.

Execution of the SBIR and STTR programs is decentralized. Both the SBIR and STTR statutes (15 U.S.C. §638) require that federal agencies with extramural R&D budgets in excess of specified amounts set aside a percentage of such funds to conduct their own SBIR and STTR programs. Currently, 11 federal departments and agencies operate SBIR programs, and 6 operate STTR programs. According to the most recent SBIR/STTR annual report, in FY2022, federal agencies awarded $4.1 billion to small businesses through the SBIR program and $618.3 million through the STTR program.

The SBIR and STTR programs have been extended and reauthorized several times since their initial enactments—1982 and 1992, respectively. On September 30, 2025, the authority for these programs, including existing pilot programs, expires. If the 119th Congress debates the reauthorization of the programs, it may consider a number of issues, including the required amount of funding an agency sets aside for the programs, the effectiveness of efforts to improve commercialization outcomes and to mitigate foreign influence and risk, and the eligibility of certain small businesses to participate in the program.

For Further Information

Marcy E. Gallo, Analyst in Science and Technology Policy

CRS In Focus IF12874, *Small Business Research Programs: Overview and Issues for Reauthorization in the 119th Congress*

Information Technology (IT) and Social Media

Rapid advancements in IT present several issues for the 119th Congress, such as the accessibility of various types of data by consumers, companies, and law enforcement entities (among others); cybersecurity; legal and policy considerations related to the ownership and use of social media platforms; and the potential impact of certain digital advertising and internet media strategies on traditional newspaper publishers and journalists.

Access to Motor Vehicle Software and Data

Motor vehicles' software supports many functions, including *telematics*, that is, the wireless transmission of data to and from vehicles and data centers hosted by vehicle original equipment manufacturers (OEMs). Access to motor vehicles' telematics data has become a focal point of policy debate around laws stipulating consumers' ability to select who repairs and services their motor vehicles.

Some industry participants and consumers contend that the growing prevalence of software and sensors within motor vehicles has enabled OEMs to limit competition in the marketplace of goods and services after the initial sale of vehicles. OEMs and motor vehicle dealerships counter that laws guaranteeing third-party access to vehicle data—whether for repair or other purposes—are unnecessary and could compromise consumer safety.

Copyright laws, typically enforced by courts, penalize consumers and third parties that violate copyright holders' exclusive rights in creative works, including software. Pursuant to a congressionally mandated triennial rulemaking, the Librarian of Congress may grant temporary three-year exemptions from certain copyright laws to allow third parties and consumers to access, store, and share vehicle operational data for repair or other purposes.

The Right to Equitable and Professional Auto Industry Repair Act (REPAIR Act; H.R. 906) was introduced in the 118th Congress but never made it out of committee. The REPAIR Act would have given the Federal Trade Commission (FTC) the authority to adopt a rule requiring OEMs to provide consumers and third parties with access to motor vehicles for the purpose of repair. It also would have permitted the FTC, in consultation with the National Highway Traffic Safety Administration (NHTSA), to require OEMs to enable third-party access to data unrelated to repair. As an alternative to enacting legislation, Members could monitor actions by states, courts, and industry participants and/or increase oversight activities of federal government agencies.

For Further Information

Dana A. Scherer, Specialist in Telecommunications Policy

CRS Report R48131, *Access to Motor Vehicle Software and Data*

Cybersecurity of Information and Communications Technology (ICT)

Policymakers and systems administrators may continue developing new cybersecurity reforms during the 119th Congress. One concern many have is the uptick of attacks on key ICT companies and products. According to the National Institute of Standards and Technology (NIST), ICT "encompasses the capture, storage, retrieval, processing, display, representation, presentation, organization, management, security, transfer, and interchange of data and information." Following are some recent, high-profile ICT cybersecurity incidents:

- **the 2020 SolarWinds attack**, in which a Russia Federation–linked attacker compromised an IT management company in order to steal data from that company's clients,
- **the 2021 Log4Shell exploitation**, in which Islamic Republic of Iran–linked actors took advantage of a common vulnerability in widely used software to access sensitive information on many web servers,
- **the 2024 global IT outage**, linked to a flawed update of cybersecurity software, and
- **the 2024 Salt Typhoon attack**, in which PRC attackers compromised telecommunications companies in order to spy on Americans.

The U.S. government has investigated these incidents and, in some cases, has made public claims of attribution and imposed sanctions on malicious actors. The compromises of IT and ICT products are concerning because they violate the chain of trust that users must have in order for these types of products to work and because a compromise of one of these technologies can provide an attacker with broad access to a large number of potential victims.

The 119th Congress may choose to oversee federal agency activities and develop legislation regarding cybersecurity requirements for trusted IT and ICT companies.

For Further Information

Chris Jaikaran, Specialist in Cybersecurity Policy

CRS In Focus IF10559, *Cybersecurity: A Primer*

CRS In Focus IF12798, *Salt Typhoon Hacks of Telecommunications Companies and Federal Response Implications*

CRS Insight IN12392, *The July 19th Global IT Outages*

Evolving Technology and the Debate over "Lawful Access" to Data

Technological advances present both opportunities and challenges for U.S. law enforcement. Some developments have increased the quantity and availability of digital content and information for investigators and analysts. Other advances have presented new hurdles for law enforcement. For example, while some observers believe that law enforcement now has access to more information than ever before, others express concern that law enforcement's investigative capabilities may be outpaced by the speed of technological change, preventing investigators from accessing certain information they may otherwise be authorized to obtain. Specifically, law enforcement officials cite strong, end-to-end encryption, or *warrant-proof encryption*, as preventing lawful access to certain data. Companies employing such strong encryption have stressed that they do not hold encryption keys. This means they may not be readily able to unlock, or *decrypt*, the devices or communications—even for law enforcement presenting an authorized search warrant or wiretap order.

The tension between law enforcement capabilities and technological change—including sometimes competing pressures for technology companies to provide data to law enforcement as well as to secure customer privacy—has received congressional attention for several decades. For instance, during the 1990s *crypto wars*, proposals to build vulnerabilities, or *back doors*, into certain encrypted communications devices as well as to restrict the export of strong encryption code were introduced. In 1994, Congress passed the Communications Assistance for Law Enforcement Act (CALEA; P.L. 103-414) to help law enforcement agencies maintain their ability

to execute authorized electronic surveillance as telecommunications providers turned to digital and wireless technology. More recently, there have been questions about whether CALEA should be amended to apply to a broader range of entities that provide communications services.

The debate over lawful access to information originally focused on *data in motion*, or law enforcement's ability to intercept real-time communications. More recent technology advances have affected law enforcement's capacity to access not only real-time communications but also stored content, or *data at rest*. Some officials have urged the technology community to develop a means to assist law enforcement in lawfully accessing certain data. At the same time, law enforcement entities have taken their own steps to bolster their technological capabilities. Other stakeholders have urged technology companies to maintain strong encryption to protect privacy. The 119th Congress may consider legislation to address law enforcement's concerns and customer privacy issues involving access to communications and data.

For Further Information

Kristin Finklea, Specialist in Domestic Security

CRS In Focus IF11769, *Law Enforcement and Technology: The "Lawful Access" Debate*

Issues Related to Social Media Platforms

Some Members of Congress have expressed interest in various aspects of social media platforms, such as Facebook, Instagram, TikTok, and YouTube. These interests include the spread of misinformation and content that may be harmful, particularly for minors; censorship of lawful content; use of algorithms to amplify or restrict content; and national security, data privacy, and foreign influence risks posed by TikTok, a social media platform owned by the Chinese company ByteDance.

Congress has enacted legislation related to social media platforms. For example, in the 117th Congress, a law was enacted banning TikTok from certain government devices (P.L. 117-328) and directing NSF to support research on the impact of social media platforms on human trafficking (P.L. 117-348). In the 118th Congress, legislation was enacted to prohibit app stores and internet hosting services from distributing, maintaining, or updating TikTok and other "foreign adversary controlled applications" (P.L. 118-50). Some states have also enacted legislation related to social media. Challenges to the validity of some of these laws are being litigated in federal courts.

Members of the 118th Congress held hearings and introduced multiple bills on social media platforms (e.g., H.R. 573, H.R. 7891, S. 147, S. 483). Some of these bills would have amended Section 230 of the Communications Act of 1934, enacted as part of the Telecommunications Act of 1996. Section 230 protects interactive computer service providers and their users from liability for publishing—and, in some instances, restricting access to or availability of—another user's content. Other bills would have implemented various requirements for social media platforms, such as providing information about their content moderation practices and implementing requirements related to their use of algorithms. Members of the 119th Congress might consider whether to introduce or enact similar bills related to social media platforms.

For Further Information

Clare Y. Cho, Specialist in Industrial Organization and Business Policy

Ling Zhu, Analyst in Telecommunications Policy

Peter J. Benson, Legislative Attorney

Valerie C. Brannon, Legislative Attorney

Michael D. Sutherland, Analyst in International Trade and Finance

Karen M. Sutter, Specialist in Asian Trade and Finance

CRS Report R46662, *Social Media: Content Dissemination and Moderation Practices*

CRS Legal Sidebar LSB11224, *Moody v. NetChoice, LLC: The Supreme Court Addresses Facial Challenges to State Social Media Laws*

CRS Report R48023, *TikTok: Frequently Asked Questions and Issues for Congress*

CRS In Focus IF12640, *TikTok and China's Digital Platforms: Issues for Congress*

CRS Legal Sidebar LSB11261, *TikTok Inc. v. Garland: Supreme Court Rejects Challenge to TikTok Divestiture Law*

CRS Legal Sidebar LSB11166, *Montana's TikTok Ban Goes Before the Ninth Circuit*

CRS Legal Sidebar LSB11266, *Technology Regulation: CRS Legal Products for the 119th Congress*, coordinated by Valerie C. Brannon

Innovation and Competition

The state of America's innovation ecosystem—the constellation of people, institutions, and enterprises engaged in R&D of new products and services—affects the long-term economic and national security of the United States. This section discusses issues that may impact the overall capacity of the United States to innovate and compete globally.

Artificial Intelligence (AI)

The ability for U.S. firms and institutions to outpace competitor nations in advancing the capabilities and deployment of AI technologies—including machine learning, generative AI, and facial recognition technologies—is widely recognized as a key component of U.S. economic and national security. Selected innovation and competition issues specific to AI are discussed below.

Oversight of Advances in AI

Interest in AI—including from the public, industry, the executive branch, and Congress—has grown alongside recent advances and widespread use of applications such as facial recognition technologies and generative AI models. As the beneficial uses of these and other AI technologies expand, so too do recognition of potential harms and calls for congressional action. Congressional activities focused on AI increased substantially in the 117th and 118th Congresses in both the House and Senate, including committee hearings, working groups creating AI policy road maps, the introduction of numerous AI-focused bills, and the passage of AI provisions in legislation. Enacted legislation includes the National Artificial Intelligence Initiative Act of 2020 (P.L. 116-283, Division E); the AI in Government Act of 2020 (P.L. 116-260, Division U, Title I); provisions focused on AI activities at NSF, the Department of Energy, and NIST within the CHIPS and Science Act (P.L. 117-167); the AI Training Act (P.L. 117-207); and the Advancing American AI Act (P.L. 117-263, §§7221-7228).

AI holds potential benefits and opportunities, such as through augmenting human decisionmaking and optimizing performance for complex tasks. It also presents challenges and pitfalls, such as perpetuating or amplifying bias and failing in unexpected ways. The complexity of AI systems, the pace of advancement in AI technologies, and the wide range of applications across sectors create policy issues of potential interest to the 119th Congress. These include questions regarding

- the balance of federal and private sector funding for AI;
- whether and, if so, how to increase access to federal resources (e.g., training datasets, computing power, and educational materials) for use in the public and private sectors, including academic research and start-up businesses;
- the impact of AI and AI-driven automation on the workforce, including potential job losses and the need for worker retraining;
- the challenges of educating students in AI, from teaching foundational concepts at the K-12 level to supporting doctoral-level training to meet increasing demand for AI expertise;
- the need for and effectiveness of federal and international coordination efforts in AI, as well as concerns over international competition in AI R&D and deployment;
- the incorporation of ethics, privacy, security, transparency, and accountability considerations in AI systems; and
- whether and, if so, how Congress might approach regulation of AI technologies.

For Further Information

Laurie Harris, Analyst in Science and Technology Policy

CRS In Focus IF12426, *Generative Artificial Intelligence: Overview, Issues, and Considerations for Congress*

CRS Report R48262, *Artificial Intelligence: CRS Experts and Points of Contact*

CRS Insight IN12458, *Artificial Intelligence: CRS Products*

The Regulation of AI in Health Care

The use of AI in health care broadly falls within three categories: diagnosis and treatment; patient engagement and adherence with treatment plans; and administrative applications. Many of these applications have been well received by stakeholders. Nevertheless, the use of AI in health care may introduce challenges in areas such as (1) data access, (2) bias, (3) lack of transparency, (4) privacy, (5) scaling and integration, and (6) uncertainty over liability.

Though the quantity of available health data has recently proliferated, it may be difficult for developers to access the large volumes of high-quality data needed to create effective AI tools. Such data may be limited or biased, reducing the safety of such AI tools and their efficacy for different patient populations. AI tools may lack transparency, making it difficult for health care providers to evaluate whether an AI tool is appropriate for a specific application. As AI tools are developed and used, increasingly large quantities of data will likely be accessible to more parties, adding to privacy risks. AI tools can be challenging to scale up and integrate into new settings because of differences among institutions and patient populations. The number of parties involved in developing and deploying AI tools has made it difficult to determine legal liability associated with these technologies. Multiple Department of Health and Human Services entities have pursued regulatory actions regarding AI. These agency efforts are nascent and somewhat fragmented, though there is a focus on unifying regulatory approaches.

The 119th Congress may consider measures that increase health data access among appropriate parties and strengthen the quality of health research initiatives, among other things. Congress may build on existing initiatives or support agencies and industry stakeholders in continuing to develop others, such as guardrails to protect access to health data.

For Further Information

Nora Wells, Analyst in Health Policy

CRS Report R48319, *Artificial Intelligence (AI) in Health Care*

Intellectual Property Issues Regarding AI

The 119th Congress, along with the executive branch and courts, may continue to confront novel policy and legal questions regarding how intellectual property law should apply to AI.

In the field of copyright law, courts to date have held that only works of human authorship are protected by copyright, precluding copyright for works created solely by AI. The U.S. Copyright Office has denied copyright registrations for artworks created by inputting text prompts into generative AI programs, and it has issued guidance stating that human authors must exercise "creative control" for their work to be copyrighted. Besides authorship issues, AI raises the possibility of copyright infringement, both when existing works are used to train AI systems and when those systems generate outputs that are similar to existing works. Dozens of pending lawsuits challenge AI companies' unauthorized use of existing works to train AI systems, while AI companies largely contend that this is a fair-use practice for which they are not legally required to obtain permission from the copyright owners. Various bills were introduced in the 118th Congress concerning copyright and AI (e.g., H.R. 6881, H.R. 7913).

Regarding patent law, federal courts have held that inventions must have a human inventor to be patented, so inventions made autonomously by AI are not patentable. The U.S. Patent and Trademark Office (USPTO) issued guidance in 2024 addressing when inventions made by humans using AI assistance may be patentable. USPTO also released separate guidance in 2024 on when inventions involving AI technologies themselves may be patented, in light of U.S. Supreme Court decisions that narrowed the scope of patentable subject matter (see "The Role of Patents in Promoting Innovation"). Stakeholders have debated how USPTO's guidance on AI and patent law will affect technological innovation and economic competition.

The potential for AI to replicate real people's voices and likenesses (including "deepfakes") also raises policy questions regarding the *right of publicity* (ROP), or the legal right to prevent certain unauthorized uses of one's name, image, likeness, and/or voice. ROP is mainly protected by state laws, although federal trademark law provides some overlapping protection. Some stakeholders have called for Congress to supplement or replace state ROP laws with federal legislation in light of concerns raised by AI. Some bills introduced in the 118th Congress, for example, would have created a federal cause of action for victims of deepfakes or other digital depictions created by AI (e.g., H.R. 3106, H.R. 5586, H.R. 6943, H.R. 7569, H.R. 9551, S. 3696, S. 4875).

For Further Information

Kevin J. Hickey, Legislative Attorney

Christopher T. Zirpoli, Legislative Attorney

Emily G. Blevins, Analyst in Science and Technology Policy

CRS Legal Sidebar LSB11251, *Artificial Intelligence and Patent Law*

Advancing Innovation at DOD

A wide range of authorities, programs, and organizations across the U.S. government support and manage technological aspects of national defense. In particular, such efforts seek to preserve or expand the defense innovation ecosystem—the set of organizations, activities, functions, and

processes that develop, produce, and field new or improved technologies and capabilities for military use.

As the U.S. federal government's share of global R&D support fell from 45% in 1960 to about 6% in 2020, some stakeholders have become concerned about the ability of the federal government and DOD, in particular, to direct the development of leading technologies. Today, commercial companies in the United States and elsewhere in the world are leading development of groundbreaking, dual-use technologies in AI, autonomous vehicles and systems, and advanced robotics. DOD's ability to maintain a technology edge for U.S. forces may increasingly depend on these external sources of innovation.

Congress and DOD have taken a number of actions to improve the defense innovation ecosystem, including providing policy direction and establishing new innovation-related positions, organizations, and programs within DOD (e.g., the Defense Innovation Unit and the Office of Strategic Capital). Despite such efforts, many defense experts and other stakeholders remain concerned that DOD is not adopting and transitioning innovative technologies to warfighters at the speed and scale necessary to deter strategic competition from the PRC and to address other threats.

Challenges remain in building the institutional mechanisms and culture within DOD that are needed to effectively access dual-use technologies from private sector companies that have not traditionally served as defense contractors. The 119th Congress may consider several issues, including improved planning, coordination, and execution across DOD components, especially innovation-related organizations; additional reforms to DOD processes (e.g., modifications to DOD's planning, programming, budgeting, and execution process); and efforts to incentivize innovation.

For Further Information

Marcy E. Gallo, Analyst in Science and Technology Policy

CRS In Focus IF12869, *The Defense Innovation Ecosystem*

CRS In Focus IF10834, *Defense Primer: Under Secretary of Defense for Research and Engineering*

CRS In Focus IF10553, *Defense Primer: Research, Development, Test, and Evaluation*

Issues for the Implementation of Regional Innovation Strategies (RISs)

Federal assistance for RISs is generally intended to help state and local stakeholders develop links between organizations so they may expand innovation, increase jobs, attract investment, and otherwise support regional economic development goals. As place-based initiatives, RIS programs, such as the Small Business Administration's Regional Innovation Clusters program, generally focus on addressing conditions in a specific location. Some RIS programs also seek to improve the development and commercialization of key technology focus areas and support U.S. innovation capacity broadly. In recent years, Congress authorized new programs and provided initial funding for certain RIS programs, including the Economic Development Administration's Regional Technology and Innovation Hubs (Tech Hubs) and NSF's Regional Innovation Engines programs.

The 119th Congress may consider appropriations for both new and existing RIS programs. Funding for the Tech Hubs program in FY2023 and FY2024, for instance, totaled $541 million—

an amount that is approximately 5% of the funding authorized to be appropriated for the FY2023-FY2027 period. If additional funding is provided, Congress may opt to provide instructions for how individual agencies allocate it (e.g., expanding the geographic diversity of awards, funding new and/or existing awardees) and whether or how various agencies coordinate awards and select the technology focus areas.

Congress may also seek to evaluate initial outcomes and review implementation milestones. Implementation issues that may impact RIS programs in the 119th Congress center on aspects of sustainability, including the availability of federal and nonfederal funding and the availability of training resources for workers as regional innovation systems develop. Outside groups suggest that while federal funding may serve as an initial catalyst, additional contributions from state and private sector partners may be important for sustaining the growth of regional ecosystems.

For Further Information

Julie M. Lawhorn, Analyst in Economic Development Policy

Adam G. Levin, Analyst in Economic Development Policy

CRS In Focus IF12712, *Place-Based Visas: Overview and Issues for Congress*

CRS In Focus IF12793, *Federal Assistance for State and Local Entrepreneurship Development Policies and Recent Legislation*

CRS In Focus IF12794, *The Role of Business Incubators and Accelerators in Entrepreneurship Support*

The Role of Immigration in the U.S. S&T Workforce

Congress has a long-standing interest in how immigration contributes to U.S. economic growth and technological innovation through the employment of foreign workers in S&T occupations. The Immigration and Nationality Act (INA; part of Title 8 of the *U.S. Code*) contains provisions permitting skilled foreign workers (i.e., having at least a four-year bachelor's degree) to immigrate temporarily or permanently to the United States.

The employment-based provisions of the INA were most recently amended in 1990. The INA limits the number of immigrants who receive lawful permanent resident status (i.e., green cards) for skilled and other types of employment to 140,000 annually. The INA also allows for several categories of skilled temporary nonimmigrants to be admitted to the United States for a specific purpose and a limited period. These include the H-1B visa for specialty occupation workers and the L-1 visa for intracompany transferees. Many of these workers are employed in S&T occupations. In addition, foreign students on F-1 visas may obtain authorization to work for one year (or up to three years for STEM majors) in fields related to their degree through optional practical training (OPT), which is not numerically limited. Nonimmigrant workers are often sponsored by their U.S. employers for employment-based green cards.

The annual statutory numerical limits for permanent, employment-based immigrants have not changed since 1990. In contrast, the annual number of foreign workers receiving H-1B visas, L-1 visas, and OPT—the latter two of which are not subject to statutory caps—has increased substantially. Observers favoring increased permanent, employment-based immigration contend that current limits are outdated. They note that U.S. gross domestic product has doubled since the INA was last amended in 1990, technological innovation has expanded enormously, and labor market expansion in recent decades has relied primarily on immigration. Other observers favoring stable or lower immigration levels contend that the increasing use of nonimmigrant temporary worker categories by U.S. employers subverts the permanent, employment-based immigration

limits established by Congress and harms the wages, working conditions, and opportunities of U.S. workers and students.

For Further Information

William A. Kandel, Specialist in Immigration Policy

Jill H. Wilson, Analyst in Immigration Policy

CRS In Focus IF12912, *The H-1B Visa for Specialty Occupation Workers*

CRS Report R47164, *U.S. Employment-Based Immigration Policy*

CRS In Focus IF12712, *Place-Based Visas: Overview and Issues for Congress*

The Role of Patents in Promoting Innovation

The U.S. patent system is designed to encourage innovation and economic growth by offering a limited-time monopoly on an invention in exchange for its public disclosure. Areas of patent policy that the 119th Congress may choose to address include patent-eligible subject matter and the Patent Trial and Appeal Board (PTAB).

Patent-eligible subject matter refers to the types of inventions that may be patented. After a series of U.S. Supreme Court decisions in the 2010s restricted patent eligibility, stakeholders have debated the effects of these decisions and possible uncertainty in patent eligibility on incentives for innovation, especially in industries such as biotechnology, AI, and computer software. USPTO issued guidance in 2019 and 2024 to clarify how its patent examiners should apply subject matter eligibility standards. Bills introduced in the 118th Congress (H.R. 8134, H.R. 9474, S. 2140) would have abrogated the Supreme Court's patent eligibility decisions and broadened the scope of patent-eligible inventions.

In 2011, Congress created PTAB, an administrative body within USPTO, to adjudicate challenges to the validity of granted patents. PTAB proceedings, such as inter partes review generally provide a faster and less expensive forum to challenge the validity of issued patents as compared to litigation in federal court. While some stakeholders argue that PTAB offers an efficient means to invalidate low-quality patents, others contend that its proceedings are unfair to patent holders and unduly undermine patent rights. Bills introduced in the 118th Congress would have reformed PTAB proceedings in various ways (e.g., H.R. 4370, S. 2220) or abolished PTAB (H.R. 8134).

Patent policy issues relating to AI are discussed separately in "Intellectual Property Issues Regarding AI."

For Further Information

Kevin J. Hickey, Legislative Attorney

Christopher T. Zirpoli, Legislative Attorney

Emily G. Blevins, Analyst in Science and Technology Policy

CRS In Focus IF12744, *Patent Law: An Introduction and Issues for Congress*

CRS In Focus IF12563, *Patent-Eligible Subject Matter Reform: An Overview*

The Role of Patents in Pharmaceutical Innovation and Competition

Patents play a particularly important role in the pharmaceutical industry. A number of patent-related issues may come before the 119th Congress given ongoing policy debates over how to

balance promoting the development of new pharmaceuticals with ensuring patient access to affordable drug treatments. While some stakeholders argue that robust patent rights are necessary to support R&D for new drugs, others argue that strategic uses of patents can unduly delay or deter generic competition and contribute to high drug prices. Should the 119th Congress seek to promote generic competition, legislative options might include limiting alleged pharmaceutical patenting practices known as "evergreening," "product hopping," "patent thickets," or "pay-for-delay settlements."

Administrative actions during the Biden Administration focused attention on several specialized policy issues concerning pharmaceutical patents and drug pricing. In September 2023, the FTC issued a policy statement warning drug manufacturers that it intended to scrutinize patents listed in the FDA publication *Approved Drug Products with Therapeutic Equivalence Evaluations*, known as the "Orange Book." Because inclusion of a patent in the Orange Book may affect when the FDA may approve a generic version of a drug, FTC argued that improper patent listing could be a violation of competition and antitrust laws. FTC has subsequently challenged hundreds of patents as improperly listed by drug manufacturers in the Orange Book.

In December 2023, NIST released draft guidance for federal agencies on "march-in rights" under P.L. 96-517, commonly referred to as the Bayh-Dole Act, which allow the federal government to issue compulsory licenses to patents on inventions made with federal funding. NIST's proposed guidance, which has not been finalized, would permit agencies to consider price as one factor in determining whether to exercise march-in rights. Much of the debate about whether product pricing should factor into an agency's march-in decision has centered on the affordability of pharmaceuticals. Some stakeholders advocate for marching in on drug patents as a means of lowering prices on drugs developed with federal funding, while others argue that doing so could discourage public-private partnerships and investments required to make nascent technologies commercially viable.

In December 2024, following objections from some stakeholders, USPTO withdrew a notice of proposed rulemaking that would have amended terminal disclaimer practice during the patent application process. Terminal disclaimers allow patent applicants to overcome certain double-patenting rejections of their applications by USPTO if they agree to shorten the term of any resulting patents. Critics of terminal disclaimers argue that this practice allows drug companies to amass a thicket of overlapping and duplicative patents to protect their products from competition, while other stakeholders argue that terminal disclaimers make patent prosecution more efficient and do not harm innovation or economic competition.

For Further Information

Kevin J. Hickey, Legislative Attorney

Christopher T. Zirpoli, Legislative Attorney

Emily G. Blevins, Analyst in Science and Technology Policy

CRS In Focus IF12644, *Patent Listing in FDA's Orange Book*

CRS In Focus IF12582, *Pricing and March-In Rights Under the Bayh-Dole Act*

CRS In Focus IF12700, *"Skinny Labels" for Generic Drugs Under Hatch-Waxman*

CRS Legal Sidebar LSB11209, *Terminal Disclaimers of Patent Rights: Background and Issues for Congress*

Telecommunications

Telecommunications technologies present several issues for policymakers. This section discusses selected telecommunications policy issues for the 119th Congress, including those related to over-the-air radio broadcast transmissions (such as access to transmissions and the impact of broadcasting technologies on copyright), policies governing federal and nonfederal radio spectrum management and use, and the security and resiliency of telecommunication networks.

AM Broadcast Radio in Motor Vehicles

More than 4,000 U.S. broadcast radio stations use amplitude modulation (AM) frequencies to transmit audio programs to listeners. AM radio also supports national and local emergency alerting systems. Since 2014, several motor vehicle manufacturers have opted not to include broadcast AM radio in electric vehicles (EVs).

The Federal Communications Commission (FCC) has statutory jurisdiction over electronic equipment that can interfere with broadcast reception. In 1980, the agency chose to exempt motor vehicle equipment from its licensing requirements, stating that including it would require further study. The exemption remains in place. The U.S. Department of Transportation's NHTSA establishes safety standards for, but does not preapprove, electronic equipment in vehicles.

Several EV manufacturers assert that their vehicle models' electronic equipment interferes with the reception of AM broadcast signals, thereby obstructing the consumer benefits of AM broadcast receivers. Broadcasters and seven former administrators of the Federal Emergency Management Agency state that the lack of access to AM radio could impede the ability of drivers and passengers to receive national and local emergency alerts. AM radio stations serve two roles during emergency alerts: (1) they are initial points of contact for presidential and nonpresidential emergency alerts in the broadcast-based transmission system regulated by the FCC, and (2) they provide one of several technology-based communications pathways for nonpresidential emergency alerts. Other pathways include communication by satellite transmissions and wireless transmission using cellular technology.

If the 119th Congress chooses to address the issue of the availability of AM radio in motor vehicles, it may consider one or more options, some of which are included in S. 315, the AM Radio for Every Vehicle Act of 2025, as introduced, and H.R. 979, a bill "to require the Secretary of Transportation to issue a rule requiring access to AM broadcast stations in motor vehicles, and for other purposes." Among other provisions, S. 315 would (1) increase the Department of Transportation's jurisdiction over motor vehicle equipment for a 10-year period and (2) direct a study examining the role of and alternatives to AM radio in the transmission of national and emergency alerts. Additional options include (1) increasing the FCC's jurisdiction over motor vehicle equipment to reduce the risk of interference with broadcast radio stations and (2) monitoring industry developments while conducting oversight.

For Further Information

Dana A. Scherer, Specialist in Telecommunications Policy

CRS Report R48315, *AM Broadcast Radio in Motor Vehicles*

Copyright Laws and Broadcasting Policies

A copyright grants the authors of a creative work certain exclusive rights in their creation. The scope of copyright in music depends on the type of work at issue and the particular use that is

made of the work, including the type of technology that is used to disseminate a work. U.S. law has explicitly recognized copyright in *musical works* (i.e., the compositions) and the public performance of those works, but current copyright protections for *sound recordings* (i.e., the recorded performances of a piece of music by musicians and singers) are more limited.

Sound recordings have a limited exclusive right of public performance that applies only to digital audio transmissions. Because over-the-air transmission by broadcast radio stations falls outside the definition of "digital audio transmission," radio stations do not need to pay royalties to the performers, record labels, or other owners of the sound-recording copyright. Though radio stations are not required to pay public performance royalties for over-the-air transmissions of a sound recording, they are required to pay for the right to transmit sound recordings via digital streaming platforms.

Those who support extending public performance rights to over-the-air broadcasts contend that doing so would create legal parity with streaming and other digital services, such as SiriusXM. Two pieces of legislation introduced in the 119th Congress focus on public performance rights for sound recordings transmitted by broadcast radio. The first, a nonbinding resolution known as the Supporting the Local Radio Freedom Act (H.Con.Res. 12 and S.Con.Res. 8), would effectively declare support for maintaining the status quo. The second, the American Music Fairness Act of 2025 (H.R. 861) and the American Music Fairness Act (S. 326), would subject performances by radio stations to the statutory license applicable to noninteractive digital services and place caps on royalties for broadcast stations with annual revenue under $1.5 million in the preceding year (unless owned by an entity with annual revenue over $10 million).

For Further Information

Dana A. Scherer, Specialist in Telecommunications Policy

Kevin J. Hickey, Legislative Attorney

CRS Report R47642, *On the Radio: Public Performance Rights in Sound Recordings*

Radio Spectrum Policy

Radio spectrum ("spectrum") is the continuum of frequencies allocated for radio transmissions. Private entities use spectrum to provide commercial services; government agencies use spectrum to carry out their missions. Access to spectrum is in high demand among companies seeking to provide wireless services, such as radio broadcasting, mobile communications, and satellite services, and is regulated by the U.S. government to enable access for all users and to avoid interference between users.

Congress oversees the activities of two entities—the FCC and the National Telecommunications and Information Administration (NTIA)—which work together to manage federal and nonfederal spectrum use. The FCC manages nonfederal use of radio frequencies in the United States, granting licenses to use specific radio frequencies for certain purposes and setting the terms and conditions of that use. NTIA manages federal spectrum use, assigns frequencies to federal agencies, presents the executive branch's views on spectrum policy to the FCC and Congress, and coordinates with the FCC to manage the nation's spectrum (i.e., the range of radio frequencies used to facilitate wireless communications).

Since much of the spectrum is already allocated for specific uses, finding spectrum for new technologies (e.g., 6G technologies) is challenging. The 119th Congress may continue to weigh policy approaches that make spectrum available for new technologies that could lead to economic growth, while also ensuring that agencies, including military and public safety agencies, have the

spectrum they need to carry out their missions. Potential options for the 119th Congress may include identifying spectrum for new uses, formalizing interagency coordination processes, facilitating the implementation of the National Spectrum Strategy, and investing in spectrum sharing R&D to increase spectrum availability.

The 119th Congress may also focus on reinstating the FCC's auction authority, which expired on March 9, 2023. When more than one nonfederal user is interested in a spectrum band, the FCC may auction spectrum licenses, awarding them to the highest bidders. Since 1993, auctions have made spectrum available for a variety of uses (e.g., 5G services, satellite-based internet), and generated over $230 billion for the U.S. government. Though legislation to restore that authority was introduced during the 118th Congress, none was enacted.

For Further Information

Patricia Moloney Figliola, Specialist in Internet and Telecommunications Policy

Jill C. Gallagher, Specialist in Telecommunications Policy

Ling Zhu, Analyst in Telecommunications Policy

CRS In Focus IF12766, *4.9 GHz Public Safety Band: Competing Views on Use*

Security and Resiliency of Telecommunications Networks

Congress has a long-standing interest in ensuring U.S. telecommunications networks are both secure and resilient in the face of natural disasters, cyberattacks, and other events. Disruptions in communications can affect national security, public safety, and economic activity.

Telecommunications networks are considered critical infrastructure and are typically privately owned, operated, and secured by the owner. Congress oversees the FCC, which regulates commercial communication services and providers, monitors commercial networks, and provides government officials and the public with information during and after natural disasters. For example, in September 2024, Hurricane Helene made landfall near Perry, Florida, disrupting cellular communications across parts of the southeastern U.S. and impacting public safety. In response, the FCC monitored and provided status updates on outages and restoration efforts. Congress has taken steps to help ensure the security and resiliency of communication networks. For example, Congress has restricted the use of untrusted equipment in U.S. networks and provided funding for the Secure and Trusted Communications Networks Reimbursement Program, which reimburses small telecommunication providers for costs to rip and replace untrusted equipment from their networks, to reduce risks to national security. Congress has also convened briefings and oversight hearings to understand the cause, impact, and future mitigation approaches to incidents and outages, such as when U.S. cybersecurity firm CrowdStrike released a faulty software update to their customers causing certain computer systems to crash and disrupting services across several industries, some government agencies (e.g., Department of Homeland Security), and public safety systems (e.g., some 911 systems).

The 119th Congress may continue to examine faults and vulnerabilities in communication networks, the effectiveness of federal government and commercial efforts to ensure continuity of service, and the federal roles for improving communication security and resiliency. In addition to technical issues, Congress may also be interested in examining nontechnical issues affecting communications and response during disasters. For example, in January 2025, an erroneous emergency alert issued during the wildfires in Los Angeles spurred questions related to alerting technologies and nontechnical issues, such as human errors in issuing alerts and the public's response to alerts.

For Further Information

Jill C. Gallagher, Specialist in Telecommunications Policy

Colby Leigh Pechtol, Specialist in Telecommunications Policy

Amanda H. Peskin, Analyst in Telecommunications Policy

CRS In Focus IF12717, *CrowdStrike IT Outage: Impacts to Public Safety Systems and Considerations for Congress*

CRS In Focus IF12779, *Restoration of Cell Phone Services: Hurricane Helene*

CRS Insight IN11663, *Secure and Trusted Communications Networks Reimbursement Program: Frequently Asked Questions*

CRS Report R48363, *The Integrated Public Alert and Warning System (IPAWS): Primer and Issues for Congress*

Author Information

Emily G. Blevins, Coordinator
Analyst in Science and Technology Policy

Marcy E. Gallo, Coordinator
Analyst in Science and Technology Policy

Todd Kuiken
Analyst in Science and Technology Policy

Amanda K. Sarata
Specialist in Health Policy

Lia Biondo
Analyst in Agricultural Policy

Kavya Sekar
Analyst in Health Policy

Hassan Z. Sheikh
Analyst in Health Policy

Pervaze A. Sheikh
Specialist in Natural Resources Policy

Eleni G. Bickell
Analyst in Agricultural Policy

Jonathan D. Haskett
Analyst in Environmental Policy

Caitlin Keating-Bitonti
Specialist in Natural Resources Policy

Eva Lipiec
Specialist in Natural Resource Policy

Laura Gatz
Specialist in Environmental Policy

Claire M. Jordan
Senior Research Librarian

Laura B. Comay
Specialist in Natural Resources Policy

Karen M. Sutter
Specialist in Asian Trade and Finance

Dana A. Scherer
Specialist in Telecommunications Policy

Chris Jaikaran
Specialist in Cybersecurity Policy

Kristin Finklea
Specialist in Domestic Security

Ling Zhu
Analyst in Telecommunications Policy

Peter J. Benson
Legislative Attorney

Valerie C. Brannon
Legislative Attorney

Michael D. Sutherland
Analyst in International Trade and Finance

Laurie Harris
Analyst in Science and Technology Policy

Nora Wells
Analyst in Health Policy

Kevin J. Hickey
Legislative Attorney

Christopher T. Zirpoli
Legislative Attorney

Julie M. Lawhorn
Analyst in Economic Development Policy

Anthony R. Marshak
Analyst in Natural Resources Policy

Nicole T. Carter
Deputy Assistant Director and Specialist/RSI

Clare Y. Cho
Specialist in Industrial Organization and Business Policy

Omar M. Hammad
Analyst in Environmental Policy

Kristen Hite
Legislative Attorney

Angela C. Jones
Analyst in Environmental Policy

Jerry H. Yen
Analyst in Environmental Policy

Adam G. Levin
Analyst in Economic Development Policy

William A. Kandel
Specialist in Immigration Policy

Jill H. Wilson
Analyst in Immigration Policy

Patricia Moloney Figliola
Specialist in Internet and Telecommunications Policy

Jill C. Gallagher
Specialist in Telecommunications Policy

Colby Leigh Pechtol
Specialist in Telecommunications Policy

Amanda H. Peskin
Analyst in Telecommunications Policy

Disclaimer