

with critical material needs, including Federal programs involving research and development, in a manner that complements related efforts carried out by the private sector and other domestic and international agencies and organizations;

(D) examine options for accessing and developing critical materials through investment and trade with our allies and partners and provide recommendations;

(E) evaluate and provide recommendations to incentivize the development and use of advances in science and technology in the private industry;

(F) assess the need for and make recommendations to address the challenges the United States critical materials supply chain workforce faces, including aging and retiring personnel and faculty, and foreign competition for United States talent;

(G) develop, and update as necessary, a strategic plan to guide Federal programs and activities to enhance scientific and technical capabilities across critical material supply chains, including a roadmap that identifies key research and development needs and coordinates on-going activities for source diversification, more efficient use, recycling, and substitution for critical materials; as well as cross-cutting mining science, data science techniques, materials science, manufacturing science and engineering, computational modeling, and environmental health and safety research and development;

(H) assess the need for, and make recommendations concerning, the availability and adequacy of the supply of technically trained personnel necessary for critical materials research, development, extraction, and industrial production, with a particular focus on the problem of attracting and maintaining high-quality professionals for maintaining an adequate supply of energy critical materials; and

(I) report to the appropriate Congressional committees on activities and findings under this section.

(c) Definitions of critical mineral and critical mineral or metal

In this section, the terms “critical mineral” and “critical mineral or metal” include any host mineral of a critical mineral (within the meaning of those terms in section 1606 of title 30).

(Pub. L. 117-167, div. B, title III, §10359, Aug. 9, 2022, 136 Stat. 1564.)

§ 19068. Advancing IoT for Precision Agriculture Capabilities Act

(a) Short title

This section may be cited as the “Advancing IoT for Precision Agriculture Act of 2021”.

(b) Purpose

It is the purpose of this section to promote scientific research and development opportunities for connected technologies that advance precision agriculture capabilities.

(c) Foundation directive on agricultural sensor research

In making awards under the sensor systems and networked systems programs of the Foundation, the Director shall include in consideration of portfolio balance research and development on sensor connectivity in environments of intermittent connectivity and intermittent computation—

(1) to improve the reliable use of advance sensing systems in rural and agricultural areas; and

(2) that considers—

(A) direct gateway access for locally stored data;

(B) attenuation of signal transmission;

(C) loss of signal transmission; and

(D) at-scale performance for wireless power.

(d) Omitted

(e) GAO review

Not later than 18 months after August 9, 2022, the Comptroller General of the United States shall provide—

(1) a technology assessment of precision agriculture technologies, such as the existing use of—

(A) sensors, scanners, radio-frequency identification, and related technologies that can monitor soil properties, irrigation conditions, and plant physiology;

(B) sensors, scanners, radio-frequency identification, and related technologies that can monitor livestock activity and health;

(C) network connectivity and wireless communications that can securely support digital agriculture technologies in rural and remote areas;

(D) aerial imagery generated by satellites or unmanned aerial vehicles;

(E) ground-based robotics;

(F) control systems design and connectivity, such as smart irrigation control systems;

(G) Global Positioning System-based applications; and

(H) data management software and advanced analytics that can assist decision making and improve agricultural outcomes; and

(2) a review of Federal programs that provide support for precision agriculture research, development, adoption, education, or training, in existence on August 9, 2022.

(Pub. L. 117-167, div. B, title III, §10361, Aug. 9, 2022, 136 Stat. 1567.)

Editorial Notes

CODIFICATION

Section is comprised of section 10361 of Pub. L. 117-167. Subsec. (d) of section 10361 of Pub. L. 117-167 amended section 1862i of this title.

§ 19069. Astronomy and satellite constellations

The Director shall support research into and the design, development, and testing of mitigation measures to address the potential impact of

satellite constellations on Foundation scientific programs by—

(1) making awards on a competitive basis to support study of the potential impacts of satellite constellations on ground-based optical, infrared, and radio astronomy, including through existing programs such as Spectrum and Wireless Innovation enabled by Future Technologies (SWIFT) and the Spectrum Innovation Initiative;

(2) supporting research on potential satellite impacts and benefits and mitigation strategies to be carried out at one or more Foundation supported Federally Funded Research and Development Centers or major multiuser research facilities as defined in section 1862s-2(g) of this title, as appropriate; and

(3) supporting workshops related to the potential impact of satellite constellations on scientific research and how those constellations could be used to improve scientific research.

(Pub. L. 117-167, div. B, title III, §10362, Aug. 9, 2022, 136 Stat. 1568.)

§ 19070. Research on the impact of inflation

(a) In general

The Director may make awards, on a competitive merit-reviewed basis, to institutions of higher education or nonprofit organizations (or consortia of such institutions or organizations) to support research to improve our understanding of the impact of inflation.

(b) Use of funds

Activities funded by an award under this section may include—

(1) measuring the economic impact of inflation on the American people, including an analysis of cost-of-living and wage impacts;

(2) considering the impact of inflation on American international competitiveness;

(3) evaluating the impact of inflation on rural and underserved communities throughout the country;

(4) assessing the ways inflation could impact future American generations; and

(5) evaluating the impact of policymaking on inflation, including the impact of further Government spending.

(c) Coordination to avoid duplication

In making awards under this section, the Director shall, for purposes of avoiding duplication of activities and research, consult, collaborate, and coordinate with the programs and policies of other relevant Federal agencies.

(Pub. L. 117-167, div. B, title III, §10363, Aug. 9, 2022, 136 Stat. 1568.)

§ 19071. Microgravity utilization policy

(a) Sense of Congress

It is the sense of Congress that space technology and the utilization of the microgravity environment for science, engineering, and technology development is critical to long-term competitiveness with near-peer competitors, including China.

(b) Policy

To the extent appropriate during an award period, the Foundation shall facilitate access by

recipients of Foundation awards to the microgravity environment, including in private sector platforms, for the development of science, engineering, and technology relevant to the award.

(c) Report

Not later than 180 days after August 9, 2022, the Director shall provide to the appropriate committees of Congress a report on the Foundation's plan for facilitating awardee access to the microgravity environment.

(Pub. L. 117-167, div. B, title III, §10364, Aug. 9, 2022, 136 Stat. 1569.)

PART F—RESEARCH INFRASTRUCTURE

§ 19081. Facility operation and maintenance

(a) In general

The Director shall continue the Facility Operation Transition pilot program for a total of 5 years.

(b) Cost sharing

The Facility Operation Transition program shall provide funding for 10 to 50 percent of the operations and maintenance costs for major research facilities that are within the first five years of operation, where the share is determined based on—

(1) the operations and maintenance costs of the major research facility; and

(2) the capacity of the managing directorate or division to absorb such costs.

(c) Report

After the fifth year of the pilot program, the Director shall transmit a report to Congress that includes—

(1) an assessment, that includes feedback from the research community, of the effectiveness of the pilot program for—

(A) supporting research directorates and divisions in balancing investments in research grants and funding for the initial operation and maintenance of major facilities;

(B) incentivizing the development of new world-class facilities;

(C) facilitating interagency and international partnerships;

(D) funding core elements of multi-disciplinary facilities; and

(E) supporting facility divestment costs; and

(2) if deemed effective, a plan for permanent implementation of the pilot program.

(Pub. L. 117-167, div. B, title III, §10371, Aug. 9, 2022, 136 Stat. 1570.)

§ 19082. Reviews

The Director shall periodically carry out reviews within each of the directorates and divisions to assess the cost and benefits of extending the operations of research facilities that have exceeded their planned operational lifespan.

(Pub. L. 117-167, div. B, title III, §10372, Aug. 9, 2022, 136 Stat. 1571.)

§ 19083. Helium conservation

(a) Major research instrumentation support

(1) In general

The Director shall support, through the Major Research Instrumentation program,