MEMORANDUM

TO: Committee on Science, Space, and Technology Members and Staff
FROM: Science, Space, and Technology Committee Staff
DATE: December 2, 2013
RE: Full Committee Markup

The Committee on Science, Space, and Technology will meet on **Thursday, December 5, 2013, at 9:00 a.m.** in Room 2318 of the Rayburn House Office Building to consider the following:

- **H.R. 2413, the Weather Forecasting Improvement Act of 2013**
- **H.R. 2431, the National Integrated Drought Information System Reauthorization Act of 2013**
- **H.R. 2981, the Technology and Research Accelerating National Security and Future Economic Resiliency Act of 2013**
- **H.R. 3625, To provide for termination liability costs for certain National Aeronautics and Space Administration projects, and for other purposes**

H.R. 2413, the Weather Forecasting Improvement Act of 2013

Background and Need

Recent severe weather events in the United States have underscored the need for timely, accurate, and reliable weather forecasts. Within NOAA, the National Weather Service (NWS), the Office of Oceanic and Atmospheric Research (OAR), and the National Environmental Satellite, Data, and Information Service (NESDIS) play important roles in developing and deploying U.S. weather forecasting capabilities. NOAA is joined in this effort by an ever-evolving private sector weather enterprise. The National Academy of Sciences recently emphasized the importance of this partnership, noting that "[p]rivate sector and other organizations provide sensor data, weather forecasts, and end-user services to a broad set of customers."

Rapid technological advances in computing and other areas such as remote sensing and advanced radar hold great promise to improve severe weather prediction, but have yet to be fully exploited. In a 2012 report on the NWS, the National Academy of Sciences stated that "[a]s an outgrowth of public and private sector investment in weather, climate, and hydrological research, new observational, data assimilation, prediction, and other technology advancements are exceeding the capacity of the NWS to optimally acquire, integrate, and communicate critical forecast and warning information based on these technological achievements."

The Weather Forecasting Improvement Act of 2013 (H.R. 2413) introduced by Environment Subcommittee Vice Chairman Jim Bridenstine will prioritize the mission of NOAA to include the protection of lives and property, and make funds available to improve weather-related research, operations, and computing resources. The bill directs NOAA to undertake quantitative,

cost-benefit assessments to determine the best combination of systems for obtaining data for forecasts. It also directs NOAA to prepare a report outlining the options of commercial opportunities for obtaining space-based weather observations.

Major Provisions

- Public Safety Prioritization. The bill directs the Administrator of the National Oceanic and Atmospheric Administration (NOAA)—which is responsible for everything from weather forecasting to climate and ocean research—to make weather-related activities the top management and planning priority of the agency for the protection of lives and property.

- Weather Research Prioritization. The bill codifies and expands NOAA weather research activities, directing the agency to place "priority emphasis on development of more accurate and timely warnings and forecasts of high impact weather events that endanger life and property." The bill also codifies an existing technology transfer initiative carried out jointly between the Office of Oceanic and Atmospheric Research and the National Weather Service aimed at ensuring "continuous development and transition of the latest scientific and technological advances into NWS operations."

- Weather Research Planning. The bill directs NOAA's OAR, NWS, and NESDIS to jointly develop a prioritized weather research plan to restore U.S. world leadership in weather modeling, prediction, and forecasting.

- Tornado Warning Extension Program. The bill creates a Tornado Warning Extension Program, the goal of which shall be to "develop and extend accurate tornado forecasts and warnings beyond one hour in order to reduce loss of life, injury, and damage to the economy." It also requires NOAA to prepare a program plan detailing the research and development activities and the associated budget resources necessary to successfully realize the tornado forecasting improvements.

- Hurricane Warning Extension Program. The bill creates a Hurricane Warning Extension Program, the goal of which shall be to "develop and extend accurate hurricane forecasts and warnings in order to reduce loss of life, injury, and damage to the economy." It also requires NOAA to prepare a program plan detailing the research and development activities and the associated budget resources necessary to successfully realize the hurricane forecasting improvements.

- Improved Observing System Planning. The bill directs NOAA to systematically evaluate the combination of observing systems necessary to meet weather forecasting data requirements, and develop a range of options to address potential data gaps. The bill further specifies that one component of this planning effort shall include Observing System Simulation Experiments (OSSEs) to quantitatively assess the relative value and benefits of potential observing capabilities and systems.

- Encouragement of Private Sector Weather Forecasting Solutions. The bill clarifies that NOAA is not prohibited from obtaining weather data through contracts with commercial

providers, and directs NOAA to prepare a report assessing the range of commercial opportunities for obtaining cost-effective space-based weather observations.

Legislative History

H.R. 2413 was introduced on June 18, 2013 by Representative Jim Bridenstine and referred to the Committee on Science, Space, and Technology.

In the 113th Congress, the Subcommittee on Environment held two hearings on H.R. 2413. On May 23rd the Subcommittee held a hearing entitled, Restoring U.S. Leadership in Weather Forecasting, and on June 26th Part 2 of that hearing was held, which included testimony by the NOAA Acting Administrator Kathleen Sullivan. The Subcommittee also received testimony from other expert witnesses, which informed the committee on the need for improved weather forecasting and the potential for improved research and technology transition efforts to address this need.

The Subcommittee on Environment met to consider H.R. 2413 on July 9, 2013.The Subcommittee considered 8 amendments, 4 were withdrawn and 3 were agreed to by voice vote. The bill, as amended, was agreed to by voice vote, and was favorably reported to the full Committee.

Authorization

H.R. 2413 authorizes appropriations out of funds made available for Operations, Research, and Facilities in the Office of Oceanic and Atmospheric Research:

- $100,000,000 to carry out Weather Research and Forecasting Innovation of which
- $80,000,000 is authorized for weather laboratories and cooperative institutes
- $20,000,000 is authorized for weather and air chemistry research programs
- $20,000,000 for a joint technology transfer initiative (described in section 3)

Amendment in the Nature of a Substitute (ANS)

The Committee has received input from many representatives of the American weather industry and plans to offer an Amendment in the Nature of a Substitute (ANS) to the text of the bill to reflect a bipartisan consensus of the need to improve weather forecasting in the United States. New major updates included in the ANS are as follows:

Section 8. Observing System Simulation Experiments. Section 8 of the ANS specifies that OSSEs shall be conducted prior to acquisition of government owned or leased operational observing systems. It also requires the Assistant Administrator for OAR to use OSSEs to assess the value of data from GPS radio occultation and a geostationary hyperspectral sounder global constellation.

Section 9. Computing Resources Prioritization Report. Section 9 of the ANS expands on the Computing Resources Prioritization Report which directs NOAA to issue a plan that explains

how NOAA intends to: (1) aggressively pursues the newest, fastest, and most cost effective high performance computing technologies in support of its weather prediction mission; (2) ensure a balance between the research requirements; (3) take advantage of advanced development concepts; (4) identify opportunities to reallocate existing advanced computing resources from lower priority uses to improve operational weather prediction; and (5) harness new computing power in OAR and NWS and determine how it can best be utilized for immediate improvement in forecasting and experimentation.

Section 10. Commercial Weather Data. Section 10 of the ANS requires the Secretary of Commerce to transmit a strategy that assesses the range of commercial opportunities for obtaining both surface-based and space-based weather observations. The strategy shall include an analysis of financial or other benefits, methods to address planning and budgeting, and identification of the changes needed to facilitate effective implementation of such strategy.

Section 11. Weather Research and Innovation Advisory Committee. Section 11 of the ANS requires the Undersecretary to establish a Federal Advisory Committee to provide advice for prioritizing weather research initiatives at NOAA and identify emerging technologies. The Committee shall be composed of leading experts and innovators from all relevant fields of science and engineering. The Committee will provide recommendations in an annual report to the Undersecretary. The Undersecretary will relay such reports to the Science Committee.

Section 12. Interagency Weather Research and Innovation Coordination. Section 12 of the ANS requires the Director of the Office of Science and Technology Policy to establish an Interagency Committee for Advancing Weather Services. The Committee will improve coordination of relevant weather research and forecast activities across the federal government.

Section 13. Visiting OAR Researchers Program. Section 13 of the ANS gives the Assistant Administrator for OAR the authority to establish a program to detail OAR researchers to NWS. The program shall allow between five and fifteen OAR staff to spend up to one year on detail to the NWS to allow for productive interaction to improve forecasting capabilities. The Undersecretary shall submit an annual report to the Science Committee detailing the program participation and highlight any innovations that come from this interaction.

Section 14. Visiting Fellows at NWS. Section 14 of the ANS allows the Assistant Administrator for NWS to establish a program to host post-doctoral fellows and academic researchers at any of the National Centers for Environmental Prediction.

Section 16. Authorization of Appropriations. Section 16 of the ANS authorizes, out of funds made available for OAR's operations, research, and facilities appropriations account, $83 million for Fiscal Year 2014 to carry out the weather research program established under section 3. It further specifies that out of the $83 million provided in this section, $65 million is authorized for weather laboratories and cooperative institutions and $18 million is authorized for weather and air chemistry research programs. It also authorizes for FY 2014, $14 million to carry out the joint technology transfer initiative described in section 3. If the Budget Control Act is repealed or replaced, these authorizations increase for FY 2014.

For FY2015-2017, the section authorizes $100 million to carry out the weather research program established under section 3. It further specifies that out of the $100 million provided in this section, $80 million is authorized for weather laboratories and cooperative institutions and $20 million is authorized for weather and air chemistry research programs.

H.R. 2431, the National Integrated Drought Information System Reauthorization Act of 2013

Background and Need

Drought has afflicted portions of North America for thousands of years, and continues to impact substantial portions of the United States. As of November 26, 2013, more than 30 percent of the contiguous U.S. is experiencing moderate to exceptional drought conditions. For significant periods in 2012 and 2013, more than half of the country was in a drought.[1] Consequently, the coordination of resources to effectively manage drought is critical. In a 2013 report by the Congressional Research Service, drought's impact on North America is described:

> Drought often results in agricultural losses, which can have local, regional, and national effects. It also can affect other industries and services, including power and energy resource production, navigation, recreation, municipal water supplies, and natural resources such as fisheries, aquatic species, and water quality. How to address these impacts is an often recurring issue for Congress. Addressing drought on an emergency basis is costly to individuals, communities, and businesses. Additionally, millions and sometimes billions of dollars in federal assistance can be expended in response to drought's social consequences. Thus, another recurrent policy issue is how to prepare and mitigate future drought impacts and how to do so efficiently across the many federal agencies with various and sometimes overlapping drought responsibilities.[2]

The NIDIS program is housed within the Office of Oceanic and Atmospheric Research at the National Oceanic and Atmospheric Administration (NOAA). The goal of NIDIS is to "improve the nation's capacity to proactively manage drought-related risks, by providing those affected with the best available information and tools to assess the potential impacts of drought, and to better prepare for and mitigate the effects of drought."[3] In support of these goals, NOAA conducted workshops with federal, state, and local agencies, academic researchers, and other stakeholders to solicit input on how to develop a path forward. This culminated in the 2007 NIDIS Implementation Plan, which outlined the governance structure, priorities, and operational requirements needed to meet the Program's objectives.

In support of the overall program goals, the NIDIS Program is engaged in the collection, consolidation, and dissemination of drought-related data and information on an ongoing basis.

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[1] http://droughtmonitor.unl.edu/DataArchive/Tables.aspx.
[2] Congressional Research Service. *Drought in the United States: Causes and Issues for Congress*. RL34580. April 22, 2013.
[3] The National Integrated Drought Information System Implementation Plan: A Pathway for National Resilience," June 2007. Accessible at: http://www.drought.gov/pdf/NIDIS-IPFinal-June07.pdf.

The Program develops "a suite of usable drought decision support tools focused on critical management indicators, thresholds and triggers, and engages and enables proactive planning by those affected by drought."[4] In this function, NIDIS acts as a data clearinghouse, and works to develop and actively support a collaborative framework between researchers and managers. The Program also conducts knowledge assessments to "determine where major drought-information gaps occur and where research improvements are needed" as well as to "coordinate capabilities among those conducting research and research activities."[5]

The NIDIS Program developed and currently operates the U.S. Drought Portal, a website that features a range of services related to drought, including historical data on past droughts, current data from climate observations, early warnings about emerging and potential droughts, decision support services for managing droughts, and a forum for stakeholders to discuss drought-related issues.[6]

Major Provisions

NIDIS Program Amendments: The bill modifies existing language by reorganizing in order to distinguish between the function of the NIDIS program in general and the early warning system specifically. It also adds a new subsection (e) which requires the Undersecretary of Commerce to provide the Committee with a report 18 months after enactment. This report should:

- Include an analysis of the implementation of NIDIS, including how the information, forecasts, and assessments are utilized in drought planning policy and response activities;
- Describe specific plans, including future milestones, for continued development of such programs; and
- Identify research, monitoring, and forecasting needs to enhance the predictive capability of drought early warnings.

Authorization

H.R. 2431 amends Section 4 of the 2006 NIDIS Act to authorize appropriations for each of fiscal years 2014 through 2018 in the amount of $13.5 million per year.

Legislative History

H.R. 2431 was introduced on June 19, 2013 by Representative Ralph Hall and referred to the Committee on Science, Space, and Technology. The Subcommittee on Environment held a roundtable on October 2, 2013, which focused on drought issues and witnesses were asked to comment on H.R. 2431. Witnesses included Mr. J.D. Strong, Executive Director of the

[4] Roger Pulwarty, Fall 2011 NIDIS Drought Research Special Issue, "*Coping with Drought: Research in Support of NIDIS*" Volume 2, Issue 2. Accessible at: http://drought.gov/imageserver/NIDIS/newsletter/Fall_2011_Research_Special_Issue.pdf
[5] Ibid.
[6] NOAA Climate Program Office, National Integrated Drought Information System. Accessible at: http://www.cpo.noaa.gov/cpo_pa/nidis/pdf/NIDIS_Feb17.pdf

Oklahoma Water Resources Board, and Dr. Donald Wilhite, Professor in the School of Natural Resources at the University of Nebraska.

In the 112th Congress, the Science, Space, and Technology Committee held a hearing on July 25, 2012, on discussion draft legislation to reauthorize NIDIS.

In 1998, Congress passed the *National Drought Policy Act*,[7] establishing the National Drought Policy Commission to provide recommendations on the creation of a Federal policy designed to prepare for, and respond to, serious drought emergencies. A series of reports[8] ultimately led to H.R. 5136, *the National Integrated Drought Information System Act of 2006*,[9] introduced by Congressmen Ralph Hall and Mark Udall in April of 2006. On December 20, 2006, President George W. Bush signed the bill into law (Public Law 109-460). The bill authorized appropriations for the program from fiscal year 2007 through fiscal year 2012.

H.R. 2981, the Technology and Research Accelerating National Security and Future Economic Resiliency Act of 2013.

Background and Need

In fiscal year 2012, the Federal Government funded more than $131 billion in research and development (R&D) activities. Colleges and universities conduct the majority of basic research in the United States, and cumulatively receive more than half of their total research funding from federal agencies. Because of the large amount of funding expended by the Federal Government on basic research by nonprofit institutions like universities, research institutes, and national laboratories, efforts to improve the transfer of federally-funded research are of interest to both the Federal Government and stakeholders across the nation.

HR 2981, the Technology and Research Accelerating National Security and Future Economic Resiliency Act of 2013, or the TRANSFER Act of 2013, establishes a grant program at Federal Agencies that participate in the Small Business Technology Transfer program to support innovative approaches to technology transfer at institutions of higher education, nonprofit research institutions and Federal laboratories to accelerate the commercialization of federally funded research and technology by small business concerns, including new businesses.

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[7] Public Law 105-199; 105th Congress, H.R. 3035, National Drought Policy Act. Accessible at: http://www.gpo.gov/fdsys/pkg/BILLS-105hr3035enr/pdf/BILLS-105hr3035enr.pdf.
[8] Report of the National Drought Policy Commission. *Preparing for Drought in the 21st Century*. Accessible at: http://govinfo.library.unt.edu/drought/finalreport/fullreport/pdf/reportfull.pdf.
[9] Public Law 109-430; 109th Congress, H.R. 5136, The National Integrated Drought Information Act of 2006. Accessible at: http://www.gpo.gov/fdsys/pkg/PLAW-109publ430/pdf/PLAW-109publ430.pdf.

Major Provisions

- Innovative Approaches to Technology Transfer Grant Program

  Under the Innovative Approaches to Technology Transfer Grant Program, Federal agencies that participate in the Small Business Technology Transfer program would provide grants to institutions of higher education, nonprofit research institutions and Federal laboratories for activities to accelerate the commercialization of federally funded research and development, such as early-stage proof of concept funding for translational research, identification of research and technologies at institutions that have the potential for accelerated commercialization, technology maturation projects, technical validations, and mentoring and entrepreneurial education programs.

  Recipient institutions must set up program oversight boards with business and technical expertise to establish award programs and funding amounts for individual projects.

  Federal agencies may make grants up to $1,000,000 per year for up to three years to recipient institutions. Recipient institutions shall provide awards for individual projects of up to $150,000, in phased amounts, based on reaching milestones set by the oversight board.

  Each participating Federal agency shall expend 0.05 percent of its extramural research budget in fiscal years 2014 and 2015, and 0.1 percent of its extramural research budget in fiscal years 2016 and 2017.

- Program Evaluation and Data Collection

  Participating Federal agencies shall develop a program evaluation plan and collect information from grantees in order to assess the program. Program evaluation plans shall require the collection of data aimed at identifying outcomes resulting from the transfer of technology with assistance from the Innovative Approaches to Technology Transfer Grant Program.

- Evaluative Report to Congress

  The head of each participating Federal agency shall submit to Congress an evaluative report on the program, including a detailed description of the implementation of the program, a detailed description of the grantee selection process, an accounting of the funds used in the program, and a summary of the data collected under the program evaluation plan.

- Data Dissemination

  For the purposes of program transparency and dissemination of best practices, the Administrator shall include on the Small Business Innovation Program public database information on the Innovative Approaches to Technology Transfer Grant Program,

including the program evaluation plan required, a list of recipients of awards, and information on the use of grants by recipient institutions.

Legislative History

The Subcommittee on Research and Technology held a legislative hearing on a discussion draft of legislation, authorizing the Innovative Approaches to Technology Transfer grant program on Wednesday, July 24, 2013.

H.R. 2981 was introduced by Representative Collins (NY-27) on August 2, 2013, and was referred to the Committee on Science, Space, and Technology and the Committee on Small Business. Original co-sponsors of the bill include Representative Smith (TX-21), Representative Johnson (TX-30), Representative Bucshon (IN-8), Representative Lipinski (IL-3), and Representative Kilmer (WA-6).

H.R. 3625, "To provide for termination liability costs for certain National Aeronautics and Space Administration projects, and for other purposes"

Background and Need

In 2010 the President proposed the cancellation of the Constellation Program[10] after NASA Administrator Charles Bolden informed Congress that work on the Constellation Program must slow to ensure NASA would not run afoul of the Anti-Deficiency Act due to an inaccurate accounting of potential termination liability.[11]

Potential termination liability refers to an estimate of possible costs that a contractor would incur if it stopped work on a contract prior to completing performance in the event that the

Government terminated the contract for convenience.[12] The Federal Acquisition Regulations (FAR) permit government agencies to manage potential termination liability on incrementally-funded, multiple year, cost-reimbursable contracts in at least two ways: the agency may require a contractor to track and account for their own potential termination liability costs under the limitations of funds clause[13]; or, the agency may use a special termination costs clause which allows the contractor to ignore possible termination liability when calculating its contract funding request.[14]

Under the special termination costs clause, "NASA informs the contractor that it need not include potential termination liability in its contract funding request calculations under the limitation of funds

[10] Budget of the United States Government for Fiscal Year 2011, at 129-30, available at www.gpoaccess.gov/usbudget/fy11/index.html (last visited December 2, 2013).
[11] Letter From NASA Administrator Charles Bolden to House Science and Technology Committee Chairman Bart Gordon, June 9, 2010.
[12] Letter from NASA CFO Beth Robinson to House Science, Space, and Technology Committee Chairman Lamar Smith, February 22, 2013.
[13] Federal Acquisition Regulations 52.232-22
[14] Federal Acquisition Regulations 249.501-70

clause, and that NASA will still pay the contractor for allowable termination costs in addition to incurred costs in the event of a contract termination, usually up to an agreed-upon ceiling amount."[15] On most NASA contracts, the vendor is ultimately responsible for tracking their termination liability to ensure there are enough funds provided on a contract to cover any potential loss as a result of cancellation for convenience.[16] However, it is not unheard of for NASA to use a special termination costs clause, and it used them on three contracts during the Constellation Program.[17] In the past, NASA contractors have reported, and the Government Accountability Office (GAO) has cited, inconsistent practices with regard to tracking and funding termination liability properly.[18]

Following the cancellation of the Constellation Program, GAO reviewed NASA's management of potential termination liability and found, "The Agency has not issued detailed instructions or provided guidance to direct contracting officers and others on how to monitor or track termination liability and to supplement the reliance on the relevant FAR provisions. As a result, resource analysts and financial managers inconsistently monitor and fund potential termination liability across the projects we reviewed,"[19] and that "In some cases, NASA contractors said they did not view insufficient potential termination liability funding as a risk because NASA's past practice on contract terminations was to provide additional funding to the contract to cover the agreed upon termination settlement costs and they assumed this would be the continuing NASA practice."[20]

As of the beginning of calendar year 2013, contractors for the Space Launch System and Orion crew capsule carried approximately $462 million in potential termination liability costs as a result of NASA's inconsistent use of the limitation of funds clause and management of termination liability.[21] This bill will provide contractors consistency and allow them to apply reserved funds to contract work.

Major Provisions

This legislation allows contractors for "covered programs" (defined as the International Space Station, the Space Launch System, and the Orion crew capsule) to utilize all funds for development work.

Legislative History

H.R. 3625 was introduced on December 2, 2013 by Representative Mo Brooks and referred to the Committee on Science, Space, and Technology. Similar language was included in H.R. 2687, and language addressing the issue of termination liability was also included in H.R. 5781 in the 111th Congress. Addressing the issue of inconsistent application of termination liability policy has been an ongoing issue under Chairman of both parties. It was a topic at the hearing on the reauthorization of NASA on June 19, 2013.

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[15] *Ibid. 3*
[16] Government Accountability Office Report GAO-11-609R, "NASA Needs to Better Assess Contract Termination Liability Risks and Ensure Consistency in Its Practices." July 12, 2011, p. 4
[17] *Ibid. 3*
[18] *Ibid. 7*
[19] *Ibid. 7*
[20] *Ibid. 7*
[21] Information provided by NASA.