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The Honorable Eddie Bernice Johnson
Chairwoman
Committee on Science, Space, and Technology
House of Representatives

The Honorable Suzanne Bonamici
House of Representatives

The Honorable Charlie Crist
House of Representatives

The Honorable Paul Tonko
House of Representatives

National Weather Service: Information on Contractor Selection and Work Performed for Its Operations and Workforce Analysis Project

Severe weather events such as tornadoes, hurricanes, winter storms, and flooding often affect communities in the United States and have had major health, safety, and economic impacts. For example, in 2018 severe weather events—such as Hurricane Florence in the Southeast and mud slides in California—caused more than 500 fatalities, nearly 1,400 injuries, and over $40 billion in damages to crops and property in communities across the United States, according to the National Weather Service (NWS).[1]

NWS, an agency within the Department of Commerce's National Oceanic and Atmospheric Administration (NOAA), is the nation's official government authority charged with issuing weather forecasts and warnings for the protection of life and property. NWS delivers these forecasts, warnings, and other weather-related services to its core partners and other stakeholders[2] through its 168 operational units, including more than 120 weather forecast

[1]National Weather Service, *Summary of Natural Hazard Statistics for 2018 in the United States*, accessed October 1, 2019, https://www.weather.gov/hazstat/.

[2]NWS Policy Directive 10-24 defines NWS core partners as government and nongovernment entities that are directly involved in the preparation, dissemination, and discussions involving weather, water, or climate-related NWS information that supports decision-making for routine or episodic, high impact events. These entities have a unique need for increased interaction with NWS personnel for Impact-based Decision Support Services or to facilitate their role in supporting the NWS mission, according to the policy directive. Core partners include members of the emergency management community, such as state and local emergency management agencies; members of the water resources management community; government partners with missions that require close coordination with NWS, such as the Federal Aviation Administration; and media outlets. Other stakeholders include entities such as some utility companies, research councils, and the private weather industry.

offices, river forecast centers, and national centers such as the National Hurricane Center.[3] NWS services intended to help its core partners and other stakeholders prepare for and respond to severe weather events are known as Impact-based Decision Support Services. NWS has reported that it expects the demand for these services to grow as the number of severe weather events that result in significant damage increases.[4]

Over the past decade, reports by the National Academy of Sciences, the National Academy of Public Administration, and GAO have identified challenges facing NWS that may hamper the agency's ability to deliver its services, including challenges related to the agency's operations and workforce.[5] As part of its 2013 report, the National Academy of Public Administration made several recommendations aimed at improving NWS's operations, including that NWS conduct a workforce analysis and assess staff alignment and functions across the agency.

Partially in response to these and other recommendations, NWS initiated an Operations and Workforce Analysis (OWA) project in 2015. NWS established several objectives for the project, including assessing the baseline state of NWS's operations and workforce, evaluating the agency's provision of Impact-based Decision Support Services, and developing ideas to address any identified gaps in these areas.[6] NOAA selected a contractor in 2015 to conduct work for the OWA project and awarded two task orders to the contractor in 2015 and 2016.[7]

You asked us to review NOAA's contractor selection process for NWS's OWA project and the work performed by the contractor. This report describes (1) NOAA's process for selecting a contractor for the OWA project and subsequent changes to the project's scope and total price and (2) the materials and services that the contractor provided to NWS and the findings and ideas the contractor and NWS developed under the OWA project.

To describe NOAA's process for selecting a contractor for the OWA project and subsequent changes to the project's scope and total price, we reviewed agency documents associated with the project. These documents included the agency's acquisition documents such as Requests

[3]We define NWS operational units as all units in any category of units (e.g., weather forecast offices) where at least one of the units met at least two of the following three criteria: (1) issue forecasts, (2) issue warnings, and (3) has personnel that are essential emergency employees, meaning that they must report to work during severe weather, emergency events, or when the government might otherwise be shutdown.

[4]National Weather Service, *Operations and Workforce Analysis Catalog*, September 2017, accessed August 7, 2019, https://www.weather.gov/owa-catalog.

[5]See National Academy of Sciences, Committee on the Assessment of the National Weather Service's Modernization Program, *Weather Services for the Nation: Becoming Second to None* (Washington, D.C.: National Academies Press, 2012); National Academy of Public Administration, *Forecast for the Future: Assuring the Capacity of the National Weather Service* (Washington, D.C.: May 2013); and GAO, *National Weather Service: Actions Have Been Taken to Fill Increasing Vacancies, but Opportunities Exist to Improve and Evaluate Hiring*, GAO-17-364 (Washington, D.C.: May 24, 2017).

[6]NWS's original objectives for the OWA project called for the development of recommendations to address any identified gaps. However, NWS subsequently used the term "ideas" to refer to the recommendations developed as part of the project. To be consistent with NWS, we refer to the recommendations as ideas throughout this report.

[7]For this report, we define the OWA project as the work performed by the contractor under the two task orders. Under the Federal Acquisition Regulation, a task order refers to an order for services placed against an established contract or with government sources. Federal Acquisition Regulation § 2.101.

for Quotes, memorandums describing the agency's process for selecting a contractor, and copies of the General Services Administration task orders awarded to the contractor. Based on our review of these documents, we developed a timeline of key dates in the contractor selection process and in the award and execution of the task orders. To supplement our review, we also interviewed NOAA contracting officials, NWS headquarters officials, and contractor staff who were involved with the OWA project.

To describe the materials and services the contractor provided to NWS and the findings and ideas developed under the OWA project, we reviewed and summarized documentation of the materials and services the contractor provided as well as NWS documents about the findings and ideas. We also interviewed NWS officials and contractor staff who were involved with the OWA project about the materials and services provided. We did not assess the quality or sufficiency of the work performed by the contractor or the quality of the findings and ideas developed as part of the OWA project.

We conducted this performance audit from February 2019 to January 2020 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

NOAA Selected a Contractor for the OWA Project through a Competitive Process and Later Expanded the Scope of the Project, Increasing Total Price

NOAA followed a competitive process to select a contractor for the OWA project, issuing a Request for Quotes under the General Services Administration Federal Supply Schedule in December 2014.[8] NOAA received six quotes in response and considered several factors in evaluating the quotes, including technical approach, past performance, and price. NOAA determined that McKinsey & Company's quote offered the best value to the government based on these evaluation factors,[9] and in April 2015 awarded a firm-fixed-price task order to McKinsey for the OWA project.[10] The task order included a base period of approximately 7 months and two 6-month option periods. NOAA exercised both option periods in December 2015.

[8]The General Services Administration Federal Supply Schedule consists of numerous indefinite delivery, indefinite quantity contracts which provide for the delivery of an indefinite quantity, within stated limits, of supplies or services during a fixed period. Federal Acquisition Regulation § 16.504(a). NOAA issued its Request for Quotes under category 874 Mission Oriented Business Integrated Services, which has indefinite delivery, indefinite quantity contracts with over 1,000 contractors; only these contractors could submit quotes. The use of the General Services Administration Federal Supply Schedule is a competitive procedure consistent with the requirements of the Competition in Contracting Act of 1984 and the Federal Acquisition Regulation. *See* 41 U.S.C. § 152(3); Federal Acquisition Regulation § 6.102(d)(3).

[9]Best value means the expected outcome of an acquisition that, in the government's estimation, provides the greatest overall benefit in response to the acquisition's requirements. According to agency documents, NOAA considered factors other than price significantly more important than price for this evaluation.

[10]The OWA task order was a type of firm-fixed-price contract. A firm-fixed-price contract provides for a price that is not subject to adjustment on the basis of the contractor's cost experience in performing the contract. This contract type places upon the contractor maximum risk and full responsibility for all costs and resulting profit or loss. Federal Acquisition Regulation § 16.202-1.

NOAA later took two additional actions to expand the scope of the OWA project, resulting in additional work performed by McKinsey. First, NWS determined that since the work under the initial task order primarily focused on weather forecast offices, additional work that focused on other NWS units—such as regional offices and NWS headquarters—was necessary to complete the OWA project. NOAA issued a second Request for Quotes under the General Services Administration Federal Supply Schedule for a firm-fixed-price task order in March 2016 to perform this additional work.[11] In response, NOAA received one quote—from McKinsey—and awarded the second firm-fixed-price task order for the OWA project to McKinsey in April 2016.

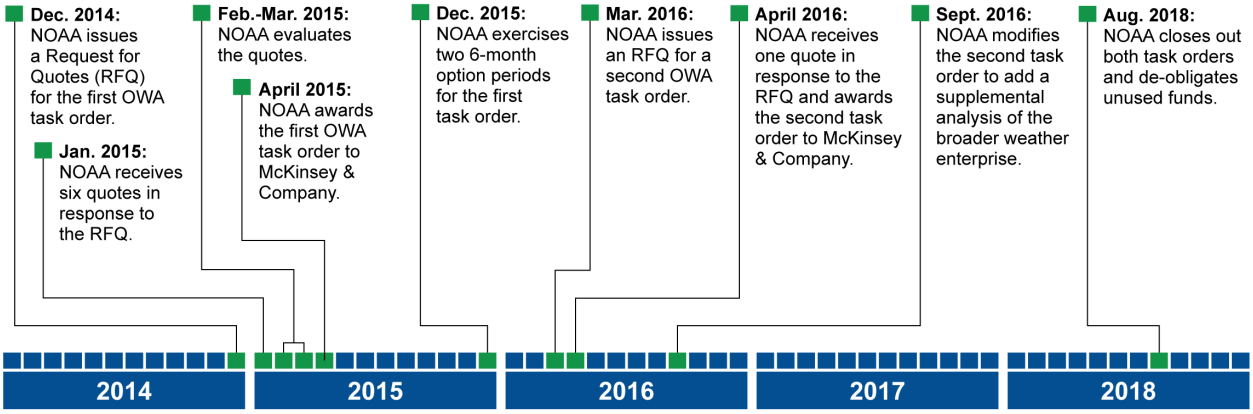
Second, in September 2016 NOAA expanded the work to be performed by McKinsey under the second task order. Specifically, NOAA modified the second task order to add new work looking at the broader weather enterprise, which encompasses public sector, private industry, and academic institutions that have a weather focus.[12] For this work, McKinsey primarily analyzed the private weather forecasting industry portion of the weather enterprise and how changes in that industry could affect NWS's role and mission in the future.

Figure 1 shows the key dates in NOAA's process for selecting a contractor and awarding and executing the task orders for the OWA project.

[11]According to NOAA documents and officials, NWS initially intended to modify the first task order or award a sole source task order to McKinsey for this additional work. However, NOAA's contracting officer determined that (1) the monetary magnitude of the additional work was too high to modify the first task order and (2) a sole source award to McKinsey was not justified because there were other capable sources. Therefore, a new Request for Quotes for a separate task order was necessary, as determined by NOAA's contracting officer. Similar to the first task order, this Request for Quotes was for a task order under the General Services Administration Federal Supply Schedule for operations and workforce analysis under category 874 Mission Oriented Business Integrated Services.

[12]NOAA supported this modification with a limited sources justification because the new work was considered a logical follow-on to the existing task order, according to NOAA documents.

Figure 1: Timeline of Key Dates in the Process for Selecting a Contractor and Awarding and Executing the Task Orders for the National Weather Service's Operations and Workforce Analysis (OWA) Project



Source: GAO analysis of National Oceanic and Atmospheric Administration (NOAA) contracting documents. | GAO-20-271R

Note: The National Weather Service, an agency within NOAA, created the OWA project to, among other things, analyze the agency's operations and workforce and develop ideas to help the agency better meet the needs of its core partners, including state and local emergency management agencies, and other stakeholders, such as some utility companies.

The total price of the OWA project increased as NOAA expanded the scope of the project. According to NOAA and NWS officials, NOAA initially anticipated awarding only one task order for the OWA project. The original price of the first task order that NOAA awarded to McKinsey in April 2015 was about $6.8 million, which included a base period and two option periods.[13] By awarding—and subsequently modifying—the second task order to add work focused on a wider range of NWS units and the broader weather enterprise, NOAA expanded the work that McKinsey was to perform and increased the price of the project. Consequently, the total price of the OWA project at the end of performance for the two task orders was over $13.7 million (see table 1).[14]

[13]NOAA prepared an independent government cost estimate for the first task order in 2014 and estimated the total price of the task order to be approximately $7.3 million. This independent government cost estimate was for a task order with a base period of 8 to 15 months and a subsequent second and third year of performance. However, the first task order NOAA awarded to McKinsey had a base period of approximately 7 months and two 6-month option periods. The independent government cost estimate for the base period and a second year of performance was approximately $6 million.

[14]In August 2018, NOAA closed out both task orders and de-obligated $143,024 of unused funds from the first task order and $89,033 from the second task order.

Table 1: Information on Cost Estimates, Awarded Prices, and Final Prices for the Task Orders for the National Weather Service's Operations and Workforce Analysis Project

Task order	Independent government cost estimate[a] (in dollars)	Awarded price[b] (in dollars)	Final price[c] (in dollars)
First task order (2015)			
Base period	2,992,000	3,955,196[d]	3,954,248
Option periods[e]	4,305,090[f]	2,817,076	2,675,000
Subtotal	**7,297,090**	**6,772,272**	**6,629,248**
Second task order (2016)			
Original award	4,800,000	4,783,491[g]	4,694,459
Modification[h]	n/a	2,393,087[i]	2,393,087
Subtotal	**4,800,000**	**7,176,579**	**7,087,546**
Total	**12,097,090**	**13,948,851**	**13,716,794**

Legend: n/a = not applicable

Source: GAO analysis of NOAA documentation. | GAO-20-271R

Note: All amounts in the table are rounded to the nearest dollar. Some numbers do not add up exactly due to rounding. The National Oceanic and Atmospheric Administration (NOAA) awarded two task orders to a contractor, McKinsey & Company, in 2015 and 2016 to conduct an analysis of the National Weather Service's operations and workforce.

[a]An independent government cost estimate helps the Contracting Officer determine the reasonableness of a contractor's cost and technical proposals.

[b]Awarded price refers to the price of each task order when it was originally awarded to McKinsey.

[c]Final price consists of the total amount obligated for each task order after all work was completed, invoiced, and paid, with remaining unpaid amounts de-obligated. NOAA closed out both Operations and Workforce Analysis task orders in August 2018 and de-obligated $143,024 from the first task order and $89,033 from the second task order.

[d]This includes the price for services and travel in the base period.

[e]The first task order included two 6-month option periods, and NOAA exercised both in December 2015.

[f]The independent government cost estimate for the first task order included separate estimates for a base period of 8 to 15 months ($2,992,000), a second year of performance ($2,998,580), and a third year of performance ($1,306,510). We include the estimates for the second and third years of performance here under the option periods; however, the first task order awarded to McKinsey included only a base period of approximately 7 months and two 6-month option periods.

[g]This includes the price for services and travel in the original second task order award.

[h]NOAA modified the second task order in September 2016 to add new work analyzing the broader weather enterprise, which encompasses public sector, private industry, and academic institutions that have a weather focus, and to increase the price of travel.

[i]The awarded price of the modification included $2,273,087 for the new work added to the task order and $120,000 for travel under the second task order.

McKinsey Provided NWS with a Range of Materials and Services Leading to Multiple Findings on NWS's Operations and Workforce and Ideas to Address These Findings

McKinsey provided NWS with a range of materials and services required under the task orders for the OWA project. Based on its work, McKinsey developed findings on NWS's operations and workforce and subsequently worked with NWS to generate ideas to address these findings.

Materials and Services McKinsey Provided to NWS

The OWA task orders identified materials and services that McKinsey was required to provide to NWS for the OWA project. Specifically, the first task order awarded in April 2015 included a defined schedule of deliverables that identified 18 items McKinsey was required to provide to NWS. Unlike the first task order, the second task order awarded in April 2016 did not include a defined schedule of deliverables. Rather, it was focused on continuing and refining the work performed under the first task order.[15] The subsequent modification to the second task order in September 2016, which added work on analyzing the broader weather enterprise, included a defined schedule of deliverables that identified 13 items McKinsey was required to provide pursuant to the modification.

McKinsey provided NWS with materials and services under the task orders from 2015 through 2017, with most materials and services provided by the end of 2016. According to NWS officials, NWS managers responsible for reviewing the materials and services McKinsey provided held weekly meetings with NWS leadership during the OWA project to determine whether the materials and services provided met the task orders' requirements. The officials said that NWS leadership also met regularly with McKinsey to provide feedback on the materials and services. Over the course of the OWA project, NWS accepted all of the materials and services that McKinsey provided as meeting the requirements under the task orders, according to NOAA and NWS officials.[16]

The materials from McKinsey included a variety of briefing slides, analytical tools such as interactive spreadsheets, and reports. For example:

- **Briefing slides.** In August and September 2015, McKinsey delivered information on the baseline status and gaps in NWS's operations and workforce through two sets of briefing slides. These briefing slides summarized (1) data that McKinsey collected from surveys of NWS staff, core partners, and other stakeholders; (2) visits to 42 NWS offices; and (3) interviews with over 500 NWS staff, core partners, and other stakeholders. McKinsey found, for example, that NWS had skill-level gaps for providing Impact-based Decision Support Services, and that in some areas the agency's workforce and workload were mismatched.
- **Interactive spreadsheet.** In July 2016, McKinsey delivered an interactive spreadsheet for use as a planning tool to analyze different workforce operating models and staffing scenarios. Among other things, the spreadsheet served as a tool to estimate costs for potential current and future staffing scenarios and to help NWS identify actions that it may need to take to achieve desired staffing levels, according to documents we reviewed.
- **Draft report.** In December 2016, McKinsey delivered a draft report to NWS describing the findings and results from its weather enterprise analysis, as well as the methodologies McKinsey used to conduct this analysis. This draft report served as the basis for the final enterprise analysis report that NWS published in June 2017. McKinsey's draft and NWS's

[15]According to the Statement of Work for the second task order, the intent of the task order was to continue the OWA's ongoing work, including providing NWS with continued assistance in developing a series of recommendations (later referred to as ideas), actionable plans, and options for an operating model, workforce model, and organizational structure that would allow the agency to better meet the needs of its core partners and other stakeholders.

[16]NWS made some of the materials publicly available on the agency's website at https://www.weather.gov/owa-catalog and https://www.weather.gov/about/weather-enterprise.

final report summarized findings on potential changes in the weather enterprise and the implications those changes may have for NWS. In particular, these findings focused on changes in the private weather industry related to customer demand, key innovations such as artificial intelligence, and growth in the private weather industry's forecasting capabilities.

McKinsey also provided a range of services under the OWA task orders, such as facilitating meetings, training sessions, and workshops. For example:

- **Meetings.** From August 2015 through December 2016, McKinsey facilitated a series of meetings with the Operations and Workforce Committee, which NWS created to oversee implementation of the OWA.[17] For example, in October 2015 McKinsey led a meeting with the committee to discuss, among other things, potential options for addressing gaps that McKinsey identified in NWS's operations and workforce. These potential options included options to improve NWS's provision of Impact-based Decision Support Services to core partners and other stakeholders.
- **Training sessions.** In fall 2016, McKinsey conducted five training sessions with NWS managers to assist them in communicating about the OWA's process, results, and next steps with NWS employees, core partners, and other stakeholders, according to NWS officials.
- **Workshop and discussion.** In October 2016, McKinsey facilitated a workshop and a follow-up discussion with NOAA and NWS officials to develop and refine a set of scenarios for potential future changes in the private weather industry, examine the implications of these scenarios for public safety and NWS's mission, and identify actions that NWS could take to help shape the future of the broader weather enterprise.

Enclosure I summarizes the materials and services that McKinsey provided to NWS under the OWA task orders.

McKinsey's Findings on NWS's Operations and Workforce and Ideas to Address Them

McKinsey generated 14 findings in 2015 based on its work under the first OWA task order. Among other things, McKinsey's findings focused on NWS's workforce, operating model, and organization, as well as its efforts to develop a more integrated field office structure. For example, McKinsey's findings described a lack of role clarity among various NWS offices, duplication of efforts in the forecast process resulting in inconsistent forecasts, and a need to improve collaboration across national, regional, and local NWS offices.

In addition, McKinsey facilitated the work of several teams of NWS managers and staff that were responsible for developing and refining ideas to address McKinsey's findings. With facilitation from McKinsey, these teams developed 28 ideas intended to address the findings and help NWS's operations and workforce evolve to, among other things, improve Impact-based Decision Support Services to better meet the needs of NWS's core partners and other stakeholders. Enclosure II provides summaries of the 14 findings and 28 ideas developed under the OWA project.

[17]The Operations and Workforce Committee consisted of senior NWS leaders and was chaired by the NWS Director.

NWS has subsequently taken steps to prioritize and begin implementing some of these ideas as initiatives under a program called Evolve, according to NWS officials. We are conducting a separate review of the Evolve Program and plan to report on NWS's implementation of these initiatives later in 2020.

Agency Comments

We provided a draft of this report to the Department of Commerce and NOAA for review and comment. NOAA provided technical comments, which we incorporated as appropriate.

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As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the appropriate congressional committees, the Secretary of Commerce, and other interested parties. In addition, the report will be available at no charge on the GAO website at https://www.gao.gov.

If you or your staff have any questions about this report, please contact me at (202) 512-3841 or fennella@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in enclosure III.

Anne-Marie Fennell
Director, Natural Resources and Environment

Enclosures – 3

Enclosure I: Materials and Services McKinsey & Company Provided to the National Weather Service (NWS) for the Operations and Workforce Analysis (OWA) Project

The OWA task orders identified a range of materials and services that McKinsey & Company was required to provide to NWS for the OWA project. Specifically, the first task order included a defined schedule of deliverables that identified 18 items McKinsey was required to provide to NWS. Unlike the first task order, the second task order did not include a defined schedule of deliverables identifying specific items that McKinsey was required to provide. Rather, it was focused on continuing and refining the work performed under the first task order. However, a subsequent modification to the second task order included a defined schedule of deliverables that identified 13 items McKinsey was required to provide pursuant to the modification. Table 2 identifies the items McKinsey was required to provide under the first OWA task order and under the modification to the second task order, and describes the materials and services that McKinsey provided in response to these items.[1]

Table 2: Summary of Materials and Services McKinsey & Company Provided to the National Weather Service (NWS) for the Operations and Workforce Analysis (OWA) Project

Items required under the OWA task orders[a]	Materials and services McKinsey provided to NWS[b]
First task order (awarded in April 2015)	
Current-state baseline and gaps report	McKinsey reported on its analysis of the baseline status and gaps in NWS's operations and workforce through two sets of briefing slides. Specifically: • In August and September 2015, McKinsey reported on the results of its analysis through two sets of briefing slides presented at meetings with NWS leadership.[c] To support this analysis, McKinsey examined several sources of data, such as data on vacancies; surveyed and interviewed NWS staff, core partners, and other stakeholders; and visited 42 NWS offices.[d] McKinsey found, for example, that NWS had skill-level gaps for providing Impact-based Decision Support Services (IDSS), and that in some areas the agency's workforce and workload were mismatched. McKinsey generated 14 findings about NWS's operations and workforce from this analysis.
Workshop to review results and path forward	According to NWS officials, McKinsey fulfilled this task order requirement by supporting NWS in establishing a committee to help oversee implementation of the OWA project and facilitating meetings with this committee throughout the project. Specifically: • McKinsey supported NWS in establishing the Operations and Workforce Committee, which consisted of senior NWS leaders and was chaired by the NWS Director. • From August 2015 through December 2016, McKinsey facilitated a series of meetings with the Operations and Workforce Committee. For example, in October 2015 McKinsey led a meeting with the committee to discuss, among other things, potential options for addressing gaps that McKinsey identified in NWS's operations and workforce. These potential options included options to improve NWS's provision of IDSS to core partners and other stakeholders.[e]

[1]NWS officials identified a limited number of additional materials and services provided to NWS under the second task order, including briefing slides and an analytical tool to help assess staffing needs and options for providing Impact-based Decision Support Services across NWS offices.

Items required under the OWA task orders[a]	Materials and services McKinsey provided to NWS[b]
Project governance structure and stakeholder map	McKinsey facilitated meetings and provided a stakeholder map, among other things. For example: • In May 2015, McKinsey facilitated a meeting with NWS leadership as part of the process for identifying and selecting members for several OWA project work teams and the Operations and Workforce Committee, which would serve as the OWA project governance structure.[f] • In August 2015, McKinsey provided a stakeholder map in the form of briefing slides to NWS leadership. The stakeholder map provided an overview of the different internal and external groups involved with NWS across a range of roles and examined ways to engage these groups in the OWA project.
Report with description of alternatives and prioritized selections for planning	McKinsey provided a report in the form of briefing slides and facilitated meetings, among other things. For example: • In October 2015, McKinsey provided a report in the form of briefing slides to NWS leadership describing short-term and long-term alternatives for changes that NWS could consider implementing to, among other things, improve its delivery of IDSS and develop a more integrated field office structure.[c] • In November 2016, McKinsey facilitated a meeting with the Operations and Workforce Committee to, among other things, prioritize initiatives based on the findings and ideas stemming from the OWA project.
Workshop to review and decide on Portfolio of Initiatives recommendations[g]	McKinsey facilitated meetings with the Operations and Workforce Committee. For example: • McKinsey facilitated meetings with the Operations and Workforce Committee about the ideas developed by the OWA work teams to address the OWA project's findings about NWS's operations and workforce. The Operations and Workforce Committee then made decisions on how to prioritize initiatives for potential action in the future. For example, based on the OWA work teams' ideas, the committee prioritized developing a new career progression and competency model for meteorologists as a short-term option.
Stakeholder engagement report	McKinsey provided a report on stakeholder engagement efforts in the form of briefing slides. Specifically: • In October 2015, McKinsey provided a report to NWS officials in the form of briefing slides describing its stakeholder engagement strategy. Among other things, this strategy included ways to communicate the purpose and findings of the OWA project to NWS staff, as well as strategies for high-level briefings to National Oceanic and Atmospheric Administration (NOAA), the Office of Management and Budget, and congressional staff to explain OWA project findings.
Detailed implementation, communication, and roll-out plan report	McKinsey provided reports in the form of briefing slides. For example: • In August 2015, McKinsey presented a communication plan for the OWA project to NWS officials as part of a set of briefing slides. • In December 2015, McKinsey provided detailed briefing slides reporting on actionable ideas developed by the OWA work teams for NWS to consider to help advance NWS's workforce, organizational structure, and provision of IDSS. The briefing slides identified a range of technological, workforce, and cultural changes needed to implement a more collaborative process across NWS. The slides also described next steps for moving forward with refining and implementing the actionable ideas, as well as potential costs associated with certain actions.[c]

Items required under the OWA task orders[a]	Materials and services McKinsey provided to NWS[b]
Workshop to share plan and build support	McKinsey provided briefing slides to help NWS officials convene a workshop to build stakeholder support for the OWA. Specifically: • To help NWS build support for the OWA among its stakeholders, McKinsey developed the stakeholder map and stakeholder engagement strategy described above and provided briefing slides to help NWS officials communicate about these efforts at a stakeholder workshop.
Stakeholder engagement report (progress report)	McKinsey provided a progress report on stakeholder engagement efforts in the form of briefing slides. Specifically: • As part of a December 2015 set of briefing slides, McKinsey provided NWS with a progress report on stakeholder engagement efforts under the OWA project. The slides described the range of methods used to engage core partners and stakeholders on the OWA project, including interviews, webinars, and presentations. The slides also presented some of the feedback obtained from various partners and stakeholders.
Change agent program, including kickoff plus three to five field and forum sessions	McKinsey provided training sessions and materials such as a communication guide, a fact sheet, briefing slides, and a question-and-answer sheet.[c] Specifically: • In fall 2016, McKinsey helped to facilitate a "communications blitz" meant to communicate upcoming changes at the agency to NWS employees through a series of materials and meetings. As part of this effort, NWS officials said that McKinsey facilitated five training sessions with NWS managers. The effort also provided NWS employees with an opportunity to share their questions and concerns about the OWA process, ideas for change, and next steps. In addition, McKinsey provided materials for NWS leadership to use for change management efforts, such as guidance to help them more effectively communicate with NWS employees.
"Playbook" of training materials	McKinsey facilitated meetings and provided briefing slides. Specifically: • In November 2015, McKinsey facilitated a meeting with NWS leadership regarding lessons learned and next steps for the OWA work teams, as well as strategies for engaging internal and external partners and stakeholders. • In March 2016, McKinsey provided a briefing to the Operations and Workforce Committee on the future of IDSS, including discussions regarding an IDSS Toolkit and ideas to help improve the delivery of IDSS.
Leadership coaching and facilitation	McKinsey facilitated coaching sessions with NWS leadership. Specifically: • From 2015 through 2017, McKinsey facilitated several coaching sessions with the NWS Director focused on topics such as change management and communications, according to NWS officials.
Pulse survey report	McKinsey worked with NWS to conduct employee surveys to help measure the agency's organizational health and performance. Specifically: • In June 2015, McKinsey worked with NWS to survey NWS employees on the agency's organizational health and performance related to topics such as leadership, innovation and learning, and culture and climate. McKinsey analyzed the results of the survey and reported the results to NWS in a set of briefing slides.[c] • In February 2017, McKinsey worked with NWS to conduct a follow-up survey (referred to as a pulse survey) to see whether there had been any changes in the results since the initial survey was administered in 2015.

Items required under the OWA task orders[a]	Materials and services McKinsey provided to NWS[b]
Implementation tracking progress report	McKinsey facilitated meetings with NWS leadership. Specifically: • In September 2016, McKinsey facilitated a meeting with the Director of NWS's Office of Planning and Programming for Service Delivery. Among other things, this meeting covered information on the proposed structure and functions of a new Program Management Office that would be responsible for managing the future implementation of initiatives based on the findings and ideas generated by the results of the OWA project.[h] • In December 2016, McKinsey facilitated a meeting with the Operations and Workforce Committee on NWS's initiatives stemming from the OWA project. This meeting included a progress update on the proposed initiatives and near-term plans and goals for implementing them, as well as a discussion about the future roles and responsibilities of the Program Management Office and the Operations and Workforce Committee.
Three to five field and forum trainings	McKinsey provided training sessions and materials such as a communication guide, a fact sheet, briefing slides, and a question-and-answer sheet.[c] Specifically: • As part of the fall 2016 "communications blitz" discussed above, McKinsey provided materials and five training sessions to NWS managers to assist them in communicating about the OWA process, results, and next steps with NWS employees, core partners, and other stakeholders.
Report on lessons learned and performance of new operating model	McKinsey provided various materials and services including meetings, workshops, and the development of a workforce model planning tool. For example: • In February and March 2016, McKinsey facilitated eight workshops with leadership from NWS regional offices and national centers focused on exploring and refining potential options for a new operating model. McKinsey then facilitated a meeting with the Operations and Workforce Committee to report on lessons learned from the workshops regarding, among other things, NWS's operating model, staffing, and organizational structure. • In July 2016, McKinsey provided NWS with an interactive spreadsheet for use as a planning tool to analyze different workforce operating models and staffing scenarios. Among other things, the spreadsheet served as a tool to estimate costs for potential current and future staffing scenarios and to help NWS identify actions that it may need to take to achieve desired staffing levels, according to documents we reviewed.
Report on potential scale-up of high risk/reward pilots	McKinsey reported on potential initiatives that NWS could implement as part of meetings facilitated with NWS leadership. Specifically: • As part of the September 2016 meeting with the Director of NWS's Office of Planning and Programming for Service Delivery discussed above, McKinsey reported on ideas for initiatives that NWS could implement in response to the results of the OWA project. • As part of the December 2016 meeting with the Operations and Workforce Committee discussed above, McKinsey reported on potential near-term goals for the different initiatives that were under consideration and facilitated a discussion about which initiatives should be acted upon first.

Items required under the OWA task orders[a]	Materials and services McKinsey provided to NWS[b]
Final report of lessons learned and accomplishments	McKinsey provided an OWA summary report, among other things. Specifically: • In September 2016, McKinsey provided a report to NWS leadership in the form of an internal white paper summarizing the findings and ideas generated by the OWA project from May 2015 through August 2016. This included a review of project methods used, McKinsey's findings, and ideas developed by the OWA work teams for implementing changes at NWS.[i]
Modification to the second task order to add a weather enterprise analysis[j] (September 2016)	
Kickoff meeting at NWS headquarters. Review work requirements, identify key personnel, and overall milestone schedule	McKinsey facilitated a meeting and provided a work plan. Specifically: • In August 2016, McKinsey facilitated a meeting with NWS and NOAA leaders to review the objectives of the weather enterprise analysis and to discuss a high-level work plan and timeline for this analysis.[k]
Milestone presentation/check in	McKinsey provided a briefing. Specifically: • In October 2016, McKinsey provided an update to NWS officials on its review of the private weather industry, including an overview of different scenarios for how demand for weather services could change, implications of these scenarios for NWS, and actions NWS could take in response to these scenarios.
PowerPoint presentation and discussion of results from phase 1 objectives	McKinsey provided a briefing. Specifically: • As part of its October 2016 briefing to NWS officials described above, McKinsey presented results from the first phase of its weather enterprise analysis, which featured an assessment of trends driving supply and demand for weather services in the private weather industry.
Raw data of interviews or sources used for assessment in Excel or other usable format. This should include how the market will be sampled, the sample size and how representative it is, and a detailed description of the methodology	McKinsey provided data and information about its analyses of the data. Specifically: • In September 2016, McKinsey provided NWS with a summary of analyses conducted and questions answered, including ones related to private weather industry dynamics, demand trends, and supply innovations. McKinsey also provided NWS with the raw data it collected and used to conduct these analyses.
Methodology/approach for developing scenarios	McKinsey identified an approach for developing scenarios related to potential changes in private weather industry capabilities and the effects such changes could have on NWS's role and mission. McKinsey then worked with NOAA and NWS officials to develop and refine these scenarios in the October 2016 workshop described below.

Items required under the OWA task orders[a]	Materials and services McKinsey provided to NWS[b]
Presentation of enterprise scenarios	McKinsey facilitated a workshop and discussion. Specifically: • In October 2016, McKinsey facilitated a workshop and a follow-up discussion with NOAA and NWS officials, including senior leaders, to develop and refine a set of scenarios regarding potential future changes in the private weather industry. These scenarios included, for example, looking at the potential effects of the private weather industry developing better forecasting capabilities as a result of investments in data analytics and machine learning. The workshop and discussion examined implications of these scenarios for public safety and NWS's mission, and identified actions NWS could take to help shape the future of the broader weather enterprise.
A value chain map and the pros, cons, and risks of each level	McKinsey facilitated a workshop with NOAA and NWS officials, including senior leaders, and provided information on how changes in the private weather industry could affect NWS's role across the weather value chain. Specifically: • In November 2016, McKinsey facilitated a workshop with NOAA and NWS officials that followed up on the October 2016 workshop described above. The November 2016 workshop included, among other things, a discussion on how changes in private weather industry capabilities could affect NWS's role and activities across the weather value chain. According to NWS documents we reviewed, the weather value chain begins with observations and monitoring, followed by modeling and forecasting, and ends with service delivery. Among other things, the materials McKinsey developed for the workshop included a map of how potential changes at different points in the value chain could affect NWS's mission.
Presentation of strategy options for NWS to consider	McKinsey provided a briefing. Specifically: • In November 2016, McKinsey provided a briefing to NWS officials to obtain input on a roadmap for implementing initiatives stemming from the OWA project and to review the topics to be covered in the final enterprise analysis report. This included a discussion of seven short-term initiatives stemming from the enterprise analysis and the broader OWA project that NWS officials identified as priorities for implementation by NWS.
Process plan for leadership tabletop exercise for strategy planning meeting	McKinsey facilitated a workshop and presented case studies. Specifically: • As part of the November 2016 workshop discussed above, McKinsey facilitated a discussion with NOAA and NWS officials, including senior leaders, regarding strategic actions NWS could take in response to the scenarios for potential changes in the private weather industry described above. McKinsey also presented the results of several case studies examining how other federal agencies adapted to changes in private industry.
Draft report that describes results and recommendations from all four phases and that includes findings and methodologies used to conduct analysis, reach conclusions, and make recommendations[l]	McKinsey provided a draft report. Specifically: • In December 2016, McKinsey provided a draft report to NWS describing the findings and results from its enterprise analysis, as well as the methodologies McKinsey used to conduct this analysis. These methodologies included analyzing publicly available information and interviewing users of weather services, private industry companies, and experts from academia, NOAA, and NWS.
PowerPoint presentation with summary of results	McKinsey provided briefing slides. Specifically: • McKinsey delivered several sets of briefing slides to NWS summarizing the results of its enterprise analysis.

Items required under the OWA task orders[a]	Materials and services McKinsey provided to NWS[b]
NWS to provide comments on draft report within 2 weeks of receipt. Comments may be provided in writing and/or during the PowerPoint presentation	This item did not require McKinsey to provide materials or services. According to NOAA and NWS officials, NWS had an opportunity to review and provide comments on McKinsey's draft report on the weather enterprise.
Final report that describes results and recommendations from all four phases and addresses any comments provided by the government	As described above, McKinsey provided a draft enterprise analysis report to NWS in December 2016. This report then served as the basis for the final enterprise analysis report that NWS published in June 2017.[m] McKinsey's draft and NWS's final report summarized findings on potential changes in the weather enterprise and the implications those changes may have for NWS. In particular, the findings focused on changes in the private weather industry related to customer demand, key innovations such as artificial intelligence, and growth in the private weather industry's forecasting capabilities.

Source: GAO analysis of materials and services McKinsey provided to NWS. | GAO-20-271R

[a]This column presents the required items as stated in the first OWA task order and the modification to the second task order.

[b]NWS officials identified which of the materials and services McKinsey provided were associated with particular items required under the OWA task orders. We did not assess the quality or sufficiency of the work performed by McKinsey or the extent to which the materials and services summarized in this column met the task order requirements.

[c]NWS made the briefing slides publicly available on its website at https://www.weather.gov/owa-catalog. In some cases, the briefing slides were partially redacted.

[d]According to NWS, core partners are government and nongovernment entities, such as state and local emergency management agencies and media outlets, that are directly involved in the preparation, dissemination, and discussions involving weather, water, or climate-related NWS information that supports decision-making for routine or episodic, high impact events. Other stakeholders include entities such as some utility companies, research councils, and the private weather industry.

[e]NWS included some information about the potential options in the materials it made publicly available on its OWA website.

[f]NWS established four work teams as part of the OWA project to develop ideas to address McKinsey's findings. Each work team was responsible for developing ideas for a specific set of findings. McKinsey helped to facilitate the work of these teams, which were made up of NWS managers and staff.

[g]The first OWA task order called for the development of recommendations to address any gaps identified as part of the OWA project. However, NWS subsequently used the term "ideas" to refer to the recommendations developed as part of the project. To be consistent with NWS, in this table we refer to the recommendations as ideas in our descriptions of the materials and services McKinsey provided.

[h]The Program Management Office has continued to manage the implementation of initiatives stemming from the OWA under the NWS Evolve Program.

[i]NWS made this white paper publicly available on its website at https://www.weather.gov/owa-catalog.

[j]The modification to the second task order added new work analyzing the broader weather enterprise, which encompasses public sector, private industry, and academic institutions that have a weather focus. In particular, this work focused on the private weather forecasting industry and how changes in that industry could affect NWS's role and mission in the future.

[k]According to NWS officials, the agency held the enterprise analysis kickoff meeting in August 2016 after the Statement of Objectives for this additional work was finalized, even though the modification to the second task order was not officially completed until September 2016.

[l]The four phases of the weather enterprise analysis included: (1) diagnosing demand and supply in the weather enterprise; (2) developing scenarios for the evolution of the weather enterprise; (3) developing options for NWS to consider in response to these scenarios; and (4) refining a strategy with actions and initiatives that NWS could consider implementing to adapt to the changing weather enterprise.

[m]NWS made the final enterprise analysis report publicly available at https://www.weather.gov/about/weather-enterprise.

Enclosure II: Findings and Ideas Developed under the National Weather Service's (NWS) Operations and Workforce Analysis (OWA) Project

Table 3 summarizes the 14 findings and 28 ideas McKinsey & Company and NWS developed under the OWA project.[1]

Table 3: Summary of Findings and Ideas Developed under the National Weather Service's (NWS) Operations and Workforce Analysis (OWA) Project

Findings from McKinsey & Company[a]	Ideas developed by the OWA work teams[b]
Some meteorologists are not optimally utilized in weather forecast offices, and the competitive promotion process for meteorologists is inefficient.	• **Develop a NWS 101 onboarding program.** Among other things, this idea called for on-the-job training and creating a new onboarding course for new employees that focused on NWS's role within the federal government, its organization, its mission and culture, and its strategy and vision. According to NWS's *Operations and Workforce Analysis Catalog*, this idea was implemented, and the first class was held in August 2016. • **Create a new meteorologist career progression.** This idea called for updating the meteorologist competency model and creating a new career progression in which both time in grade and successful demonstration of core competencies can contribute to promotion potential. According to NWS's *Operations and Workforce Analysis Catalog*, this idea would improve staff flexibility to take on a greater variety of tasks based on skill level and training and would reduce the number of hiring actions needed by NWS.
There is a difference between current and desired skill levels for Impact-based Decision Support Services (IDSS) and other functions.[c]	• **Improve overall workforce training**. As part of this idea, OWA work teams recommended developing training on building strong relationships with core partners and other stakeholders who receive IDSS and creating additional specific training for Meteorologists-in-Charge and Hydrologists-in-Charge.[d] • **Revisit federal qualification standards for meteorologists**. As part of this idea, an OWA work team recommended that federal qualification standards for meteorologists include interpersonal and social science skills to help address inconsistencies between the current standards and the skills required on the job, particularly related to communication and decision support.
There are skill-level gaps in leadership and organizational change for Meteorologists-in-Charge and Hydrologists-in-Charge.	• **Improve leadership training at all levels.** This idea called for a new leadership and development training pathway to provide additional training for staff at all levels, including for new managers. • **Develop additional specific training for Meteorologists-in-Charge and Hydrologists-in-Charge.** This idea called for a new manager orientation course to improve skills in leadership and organizational change among Meteorologists-in-Charge and Hydrologists-in-Charge. Such managers supervise nearly 60 percent of NWS's workforce, according to NWS's *Operations and Workforce Analysis Catalog*.

[1]NWS's original objectives for the OWA project called for the development of recommendations to address any identified gaps. However, NWS subsequently used the term "ideas" to refer to the recommendations developed as part of the project. To be consistent with NWS, we refer to the recommendations as ideas throughout table 3.

Findings from McKinsey & Company[a]	Ideas developed by the OWA work teams[b]
IDSS is critical to NWS partners, who say IDSS helps improve their decision-making.	• **Continue to define IDSS and how NWS can become a customer-centric, science-based service organization.** As part of this idea, an OWA work team developed a framework for how NWS offices can best provide IDSS to core partners. The work team recommended that NWS identify good examples of IDSS activities and related best practices to improve understanding of how IDSS should work and what it means to be customer-centric. • **Develop IDSS metrics.** This idea called for NWS to develop performance metrics for IDSS to measure impacts and refine plans for interacting with the agency's core partners.
IDSS is delivered inconsistently and to varying degrees, and knowledge of products and services by partners is variable.	• **Establish common partner definitions.** As part of this idea, an OWA work team developed guidelines for a more consistent approach to defining who receives IDSS and what constitutes IDSS. • **Establish standard service levels for IDSS.** The OWA work team developed ideas for the level of IDSS that different types of partners could receive. The team also developed a planning framework to help Meteorologists-in-Charge and Hydrologists-in-Charge plan IDSS activities for any given year. • **Develop additional IDSS-specific training.** As part of this idea, the OWA work team developed proposals for additional IDSS training for all NWS staff. • **Build reporting, accountability, and coaching mechanisms to support all Meteorologists-in-Charge and Hydrologists-in-Charge in achieving standard service levels.** This idea called for the development of a mechanism to track, measure, and report IDSS activities. It also called for more formalized support to develop IDSS capabilities among Meteorologists-in-Charge and Hydrologists-in-Charge. Such support could include inter-office working groups to share IDSS plans and rotational assignments to help staff share best practices.
The forecast process has some duplication of effort, does not make best use of local staff time, and can result in inconsistent forecasts.	• **Develop a collaborative forecast process that leverages technology and reduces forecast grid editing**. A collaborative forecast process aims to improve forecast quality and reduce duplication of efforts across NWS offices. An OWA work team proposed automating some aspects of this process and using new tools, such as the National Blend of Models, to provide a consistent starting point for forecasts. • **Establish the National Centers for Environmental Prediction as the source for initial forecast guidance**. The collaborative forecast process envisions a single source of initial forecast guidance that local offices can then modify based on local needs. The OWA work team proposed that the national centers provide this initial guidance across NWS service areas. • **Develop a common operating picture across NWS**. This idea called for the national centers to help develop a common and consistent operating picture across NWS. A common and consistent operating picture would involve moving from inconsistent forecasts and duplicated effort across weather forecast offices to the development of one consistent forecast per weather event that focuses on big-picture impacts. Under this vision, the national centers would provide weather watches and outlooks, while local offices would provide warnings.

Findings from McKinsey & Company[a]	Ideas developed by the OWA work teams[b]
There is a lack of role clarity between the National Service Programs and other offices, including the National Centers for Environmental Prediction and the Office of Planning and Programming for Service Delivery, and there are inconsistencies in national centers' roles and responsibilities.[e]	• **Improve the National Service Programs' role clarity with respect to other parts of NWS involved in integration and program and project management.** As part of this idea, an OWA work team considered several options for increasing role clarity. The committee overseeing the OWA project directed the work team to refine the option to have the National Service Programs synthesize policy across NWS offices. The OWA work team outlined proposed functions for the National Service Programs and field offices under that option.
There is a lack of role clarity between river forecast centers and the Office of Water Prediction/National Water Center. Moreover, Tsunami Warning Centers are not aligned with partner needs.[f]	• **Clearly define roles for river forecast centers and the Office of Water Prediction/National Water Center in the forecast process and IDSS.** An OWA work team worked with other NWS officials to develop potential ideas for the roles and responsibilities at the river forecast centers and the Office of Water Prediction/National Water Center. • **Reevaluate the reporting structure of river forecast centers.** As part of this idea, the OWA work team and water services subject matter experts considered different options for the reporting structure, including maintaining the status quo of having the river forecast centers report to NWS regional headquarters versus an alternative structure that would have the river forecast centers report to the National Water Center. • **Align Tsunami Warning Centers operationally and consider broader changes to program delivery.** As part of this idea, the OWA work team developed a variety of options for improving forecast consistency and alignment of the Tsunami Warning Centers, including options under the current organizational structure and alternative structures.
Span of control for field managers exceeds best practice standards, reducing ability to provide effective leadership and coaching.	• **Develop supervisory positions to break large span of control between regions and weather forecast offices and within weather forecast offices.** As part of this idea, an OWA work team considered different options for assigning new supervisory responsibilities at the regional level and among managers within the weather forecast offices.
NWS's organizational health is not sufficient to support desired level of high performance.	• **Focus on priority practices that have been shown to improve organizational health.** An OWA work team considered different options for implementing best practices that have been shown elsewhere to help improve organizational health, including increasing role clarity, creating an open and trusting environment, and incorporating innovative external ideas. For example, the work team considered ideas for establishing dedicated research coordinators to help improve NWS's ability to incorporate external ideas into its operations. • **Establish body of Meteorologists-in-Charge and Hydrologists-in-Charge to advise NWS Governance Councils.** This idea called for the development of a Field Leadership Committee to advise NWS's Governance Councils, which are high-level bodies consisting of senior NWS leaders that are responsible for reviewing and approving key agency decisions. In addition, the Field Leadership Committee would provide a forum within the NWS governance structure for field managers to present concerns, ideas, and best practices from the field offices. • **Utilize and expand internal rotation programs.** This idea identified internal rotation programs as a means of building staff capabilities and developing trust across different parts of the agency. Potential options ranged from rotating forecast staff across weather forecast offices to

Findings from McKinsey & Company[a]	Ideas developed by the OWA work teams[b]
	rotating staff through NWS headquarters and the national centers to facilitate leadership development.
The current distribution of staff across the country can evolve to better serve partner needs.	• **Define required office staffing based on criteria that estimate workload.** As part of this idea, an OWA work team created a blueprint outlining field office and national center functions and potential allocations of staff time, taking into account the nature of the demand for IDSS and other workload considerations. • **Produce gridded forecasts for an area larger than currently established areas, where possible.** As part of this idea, the OWA work team considered options for enabling offices to forecast across multiple coverage areas to increase forecast consistency. The work team also considered options for increasing collaboration among staff across offices, including for IDSS, training, and research partnerships.
Many weather forecast offices do not have sufficient time or flexibility to deliver IDSS due to inflexibility in the current staffing model.	• **Pursue function and form changes: "unlock" existing staff time at weather forecast offices to create flexibility to focus on IDSS and other critical activities**. As part of this idea, an OWA work team identified a variety of potential options to increase flexibility in weather forecast offices and allow for offices to reallocate staff time to priority activities such as IDSS. These options included implementing weather balloon auto-launchers and updating the career progression for meteorologists. • **Move toward a fully integrated field structure that best positions NWS's human resources based on where NWS needs them most and the functions of each office**. This idea called for a better matching of staffing levels across weather forecast offices with local demand for IDSS.
Weather forecast offices could improve collaboration across neighboring offices and across national, regional, and local offices to deliver better forecasts and services.	• **Establish formal mechanisms for offices to support each other.** This idea called for options for weather forecast office staff to provide backup or surge support to other weather forecast offices when needed to help provide additional forecast coverage and timely information to core partners and other stakeholders.
There is a mismatch in some areas between workforce and workload, indicating that the current distribution of staff across the country can evolve to better serve partner needs.	OWA work teams did not develop separate ideas for this finding, but according to NWS's *Operations and Workforce Analysis Catalog*, some of the ideas presented above were intended to also help address this finding.

Source: GAO analysis of NWS's *Operations and Workforce Analysis Catalog*. | GAO-20-271R

[a]This column summarizes McKinsey & Company's findings from its analysis under the first OWA task order, as presented in NWS's *Operations and Workforce Analysis Catalog* (September 2017), accessed August 7, 2019, https://www.weather.gov/owa-catalog.

[b]NWS established four work teams as part of the OWA project to develop ideas to help address McKinsey's findings. Each work team was responsible for developing ideas for a specific set of findings. McKinsey helped to facilitate the work of these teams, which were made up of NWS managers and staff. The information presented in this column summarizes the ideas developed by the OWA work teams, as presented in NWS's *Operations and Workforce Analysis Catalog.* NWS has taken steps to prioritize and implement some of these ideas as initiatives under the Evolve Program. We are conducting a separate review of the Evolve Program initiatives and plan to report on NWS's implementation of these initiatives later in 2020.

[c]Services intended to help NWS's core partners and other stakeholders prepare for and respond to severe weather events are known as Impact-based Decision Support Services. According to NWS, core partners are government and nongovernment entities, such as state and local emergency management agencies and media outlets, that are directly involved in the preparation, dissemination, and discussions involving weather, water, or climate-related NWS information that supports decision-making for routine or episodic, high impact events. Other stakeholders include entities such as some utility companies, research councils, and the private weather industry.

[d]The Meteorologist-in-Charge serves as the top manager of a NWS weather forecast office. The Hydrologist-in-Charge provides oversight and management for all activities in a NWS river forecast center.

[e]NWS has 11 National Service Programs: Aviation, Fire, Marine, Public, Severe, Space, Tropical, and Winter Weather, as well as Climate, Tsunamis, and Water Management/Hydrology. The National Centers for Environmental Prediction consist of nine centers, such as the National Hurricane Center, that generate products and services to support other NWS units, external partners, and the public. NWS's Office of Planning and Programming for Service Delivery is responsible for defining the agency's long-term strategic goals and objectives and overseeing change management efforts within the agency.

[f]NWS has 13 river forecast centers that monitor major river systems and aquifers to produce river and flood forecasts, among other things. The Office of Water Prediction and its National Water Center support the river forecast centers and provide other information and services to strengthen NWS's forecast capabilities for floods and droughts, as well as to improve preparedness for water-related disasters. The Tsunami Warning Centers monitor seismic and sea level activity and issue tsunami forecasts and warnings.

Enclosure III: GAO Contact and Staff Acknowledgments

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Staff Acknowledgments

In addition to the contact named above, Alyssa M. Hundrup (Assistant Director), Joshua Wiener (Analyst in Charge), Douglas G. Hunker, and Shylene Mata made key contributions to this report. Also contributing to the report were Kendall Childers, Ellen Fried, Cindy Gilbert, Steven Lozano, Christine Pecora, Dan C. Royer, Jeanette M. Soares, Alyssa Weir, and Tatiana Winger.

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