



Testimony

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Representatives

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NATIONAL WEATHER SERVICE

Reform Efforts Could Benefit from Additional Actions and Continued Attention

Statement of Cardell D. Johnson, Acting Director,
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GAO@100 Highlights

Highlights of [GAO-22-105449](#), a testimony before the Committee on Science, Space, and Technology, House of Representatives

Why GAO Did This Study

Extreme weather events, such as tornadoes and hurricanes, can devastate communities across the United States. NWS plays a critical role in the nation's efforts to prepare for and respond to such events, including by developing weather forecasts and issuing warnings to help protect life and property. NWS has determined that it needs to reform its operations and workforce to effectively carry out its responsibilities and to improve its provision of services to emergency managers and other partners.

This testimony discusses (1) the extent to which NWS has followed selected leading practices for effective agency reforms and (2) staffing challenges NWS faces as it pursues its reform efforts. The testimony is based on a report GAO issued in September 2021, [GAO-21-103792](#), on the agency's reform efforts, as well as previous GAO work on NWS from [May 2017](#) and [January 2020](#).

What GAO Recommends

In a September 2021 report, GAO made three recommendations to NWS, including that the agency revise its approach to staffing the Evolve Program to improve leadership continuity, staff continuity, and the sufficiency of staff resources to effectively implement the agency's reform efforts. In responding to that report, the Department of Commerce agreed with GAO's recommendations.

View [GAO-22-105449](#). For more information, contact Cardell D. Johnson at (202) 512-3841 or JohnsonCD1@gao.gov.

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What GAO Found

The Department of Commerce's National Weather Service (NWS) initiated the Evolve Program in 2017 to carry out a series of agency reforms to help achieve its strategic vision of strengthening the nation's readiness for and response to extreme weather events. The program has 20 reform initiatives, in varying stages of completeness, that are intended to free up staff time and improve service to the agency's partners (e.g., state emergency managers), among other things. In September 2021, GAO found that NWS has substantially followed five of the eight leading practices for effective agency reforms that GAO examined.

Extent to Which NWS Has Followed Selected Leading Practices for Effective Agency Reforms

Practice	Extent followed
Establishing goals and outcomes	○
Involving employees and key stakeholders	○
Using data and evidence	●
Addressing fragmentation, overlap, and duplication	●
Leadership focus and attention	○
Managing and monitoring	●
Strategic workforce planning	●
Employee performance management	●

Legend:

- **Substantially followed**—NWS took actions that addressed most or all aspects of the selected key questions GAO examined for the practice.
- **Partially followed**—NWS took actions that addressed some, but not most, aspects of the selected key questions GAO examined for the practice.

Source: GAO analysis of National Weather Service (NWS) documents and interviews with NWS officials. | [GAO-22-105449](#)

However, there are gaps in the extent to which the agency has followed the other three leading practices. For example, in the area of leadership focus and attention, NWS has designated three leadership positions as having primary responsibility for leading the implementation of the reforms under the Evolve Program. However, the agency has not established a dedicated implementation team with the capacity to manage the reform process. Instead, the agency has primarily relied on rotating leaders and part-time staff for the Evolve Program, an approach that has not provided adequate leadership continuity, staff continuity, or staff resources for the program. By revising its approach to staffing the Evolve Program and addressing the other gaps, as GAO recommended in September 2021, NWS would have better assurance its reform efforts will succeed.

The agency also faces staffing challenges that could affect its reform efforts. In its 2019 strategic human capital plan, NWS highlighted challenges related to staffing levels, vacancies, and hiring that could affect the agency's resources and capacity to implement its proposed reforms. These are long-standing issues that have been highlighted in previous studies, including a May 2017 GAO report. In September 2021, GAO found that these challenges continue. Continued attention to addressing these staffing challenges could help to reduce the risk that they will impede the agency's reform efforts.

Madam Chairwoman Johnson, Ranking Member Lucas, and Members of the Committee:

Thank you for the opportunity to discuss our work on the National Weather Service's (NWS) reform efforts and staffing challenges. NWS, an agency within the Department of Commerce's National Oceanic and Atmospheric Administration (NOAA), plays a critical role in the nation's efforts to prepare for and respond to extreme weather events, such as tornadoes and hurricanes, which can devastate communities. Among other things, NWS is responsible for developing weather forecasts and issuing warnings when weather conditions pose a threat to life and property. However, over the past decade, reports by the National Academy of Sciences and the National Academy of Public Administration, as well as our previous work, have identified challenges facing NWS that may hamper the agency's ability to deliver its services, including challenges related to staffing and other workforce issues.¹

NWS's leadership has determined that reforming the agency's operations and workforce is critical to achieving its strategic vision of building a "weather-ready nation." Central to this vision is an emphasis on providing Impact-based Decision Support Services (IDSS), which the agency uses to help its core partners and other stakeholders prepare for and respond to extreme weather events.² IDSS includes services such as delivering specialized briefings to core partners and deploying agency staff to state emergency operations centers in anticipation of major storm events. To help enhance the agency's provision of IDSS and achieve its vision of a weather-ready nation, NWS launched the Evolve Program in 2017 to

¹See 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).

²NWS Policy Directive 10-24 defines NWS core partners as government and nongovernment entities that are directly involved in the preparation, dissemination, and discussion of weather, water, or climate-related NWS information that supports decision-making for routine or episodic high-impact events. 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 utility companies, research councils, and the private weather industry.

implement a series of reform initiatives. The agency also established a program management office (PMO) to lead the Evolve Program.³

My statement today will focus on (1) the extent to which NWS has followed selected leading practices for effective agency reforms and (2) staffing challenges NWS faces as it pursues its reform efforts. My statement is based on the findings from our September 2021 report on NWS's reform efforts under the Evolve Program, as well as our previous work on NWS from May 2017 and January 2020.⁴ Each of these reports provides detailed descriptions of the methodology we followed to conduct the work.

We conducted the work on which this statement is based 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.

Background

Partially in response to reports by the National Academy of Sciences and the National Academy of Public Administration, NWS implemented an Operations and Workforce Analysis project from 2015 to 2017. This project included assessing the baseline state of the agency's operations and workforce and evaluating its provision of IDSS.⁵ We reported on the Operations and Workforce Analysis project in 2020 and found that it produced 14 findings and 28 ideas to help NWS improve its provision of IDSS and agency management more broadly.⁶ The project's results

³According to NWS officials, NWS initially set up the PMO in late 2016 but did not formally establish the PMO until July 2017 with the signing of the Evolve PMO Charter.

⁴GAO, *National Weather Service: Additional Actions Needed to Improve the Agency's Reform Efforts*, [GAO-21-103792](#) (Washington, D.C.: Sept. 29, 2021); *National Weather Service: Information on Contractor Selection and Work Performed for Its Operations and Workforce Analysis Project*, [GAO-20-271R](#) (Washington, D.C.: Jan. 30, 2020); and [GAO-17-364](#).

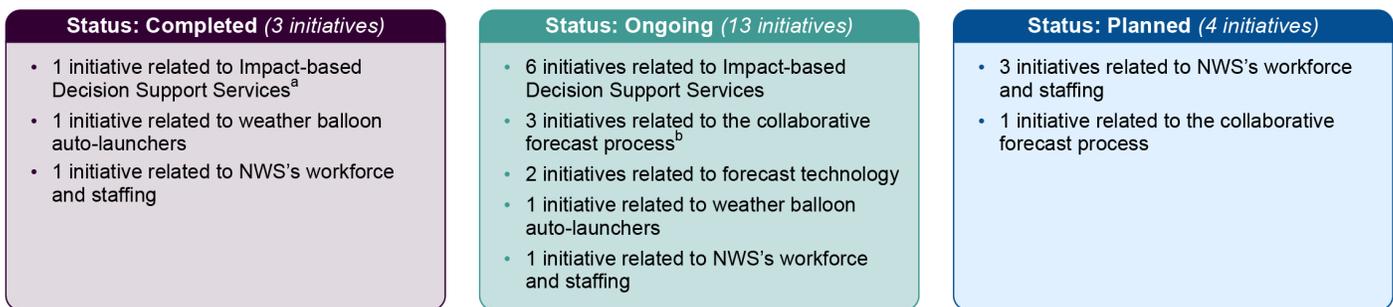
⁵NOAA awarded two task orders to a contractor, McKinsey & Company, in 2015 and 2016 for the Operations and Workforce Analysis project. In our 2020 report, we found that the total price of the project at the end of performance for the two task orders was over \$13.7 million. For more information, see [GAO-20-271R](#).

⁶For more information about the findings and ideas developed under the Operations and Workforce Analysis project, see [GAO-20-271R](#).

provided a general foundation for the agency’s subsequent reform efforts, helped to prompt the establishment of the Evolve Program, and formed the basis for some of the initiatives established under the program.

As of August 2021, NWS’s reform efforts under the Evolve Program comprised 20 initiatives. The initiatives are intended to help free up staff time and improve the provision of IDSS to the agency’s partners, among other things. As shown in figure 1, the initiatives are in varying stages of completeness.⁷

Figure 1: Status of the Evolve Program’s Initiatives, as of August 2021



Source: GAO analysis of National Weather Service (NWS) documents and information provided by NWS officials. | GAO-22-105449

^aImpact-based Decision Support Services are services, such as specialized briefings and on-site support, that NWS provides to help its partners, including state and local emergency management agencies, prepare for and respond to extreme weather events.

^bNWS is developing a new collaborative forecast process intended to help reduce forecast inconsistencies and unnecessary duplication of effort across NWS offices.

NWS Has Substantially Followed Many Selected Leading Reform Practices, but Gaps Exist

In our September 2021 report, we found that in carrying out the Evolve Program, NWS substantially followed five of the eight leading practices for effective agency reforms that we examined but that gaps remained in

⁷For additional information and descriptions of the 20 initiatives, see [GAO-21-103792](#).

the extent to which it followed the other three (see table 1).⁸ Specifically, we identified gaps in performance measures (part of the leading practice of establishing goals and outcomes), communications with employees (part of the leading practice of involving employees and key stakeholders), and staffing of the Evolve PMO’s leadership and staff positions (part of the leading practice of leadership focus and attention). We recommended actions, which I will discuss later, that the agency should take to address those gaps and help improve its reform efforts under the Evolve Program. The Department of Commerce agreed with our recommendations.

Table 1: Assessment of the Extent to Which NWS Has Followed Selected Leading Practices for Effective Agency Reforms in Carrying Out the Evolve Program

Selected leading practice	Selected key questions associated with the practice	Extent followed
Establishing goals and outcomes	<ul style="list-style-type: none"> To what extent has the agency established clear outcome-oriented goals and performance measures for the proposed reforms? To what extent has the agency shown that the proposed reforms align with the agency’s mission and strategic plan? 	●
Involving employees and key stakeholders	<ul style="list-style-type: none"> How and to what extent has the agency engaged employees and employee unions in developing the reforms (e.g., through surveys or focus groups) to gain their ownership for the proposed changes? How and to what extent has the agency involved other stakeholders, as well as its customers and other agencies serving similar customers or supporting similar goals, in the development of the proposed reforms to ensure the reflection of their views? Is there a two-way continuing communications strategy that listens and responds to concerns of employees regarding the effects of potential reforms? 	●
Using data and evidence	<ul style="list-style-type: none"> What data and evidence has the agency used to develop and justify its proposed reforms? How, if at all, were the results of the agency’s enterprise risk management process used to help guide the proposed reforms? 	●

⁸See [GAO-21-103792](#). In that report, we assessed NWS’s Evolve reform efforts against selected leading reform practices from our June 2018 report that identified leading practices and associated key questions for assessing agency reforms. In that 2018 report, we defined the term “reforms” broadly, to include any organizational changes—such as major transformations, mergers, consolidations, and other reorganizations—and efforts to streamline and improve the efficiency and effectiveness of government operations. We focused our 2021 assessment on the eight leading reform practices and selected key questions for those practices that we determined were most relevant to the Evolve reform efforts based on our review of Evolve Program documents and interviews with NWS officials. We did not include four leading reform practices from our 2018 report that we determined were less relevant for the purpose of our assessment of the Evolve Program. For the full list of leading reform practices and their associated key questions, see GAO, *Government Reorganization: Key Questions to Assess Agency Reform Efforts*, [GAO-18-427](#) (Washington, D.C.: June 13, 2018).

Selected leading practice	Selected key questions associated with the practice	Extent followed
Addressing fragmentation, overlap, and duplication	<ul style="list-style-type: none"> To what extent has the agency identified cost savings or efficiencies that could result from reducing or better managing areas of fragmentation, overlap, and duplication? To what extent has the agency addressed areas of fragmentation, overlap, and duplication in developing its reform proposals? 	●
Leadership focus and attention	<ul style="list-style-type: none"> Has agency leadership defined and articulated a succinct and compelling reason for the reforms (i.e., a case for change)? Has the agency designated a leader or leaders to be responsible for the implementation of the proposed reforms? Has the agency established a dedicated implementation team that has the capacity, including staffing, resources, and change management, to manage the reform process? 	◐
Managing and monitoring	<ul style="list-style-type: none"> Has the agency developed an implementation plan with key milestones and deliverables to track implementation progress? Has the agency put processes in place to collect the needed data and evidence that will effectively measure the reforms' outcome-oriented goals? 	●
Strategic workforce planning	<ul style="list-style-type: none"> To what extent has the agency conducted strategic workforce planning to determine whether it will have the needed resources and capacity, including the skills and competencies, in place for the proposed reforms or reorganization? How has the agency assessed the effects of the proposed agency reforms on the current and future workforce, and what does that assessment show? 	●
Employee performance management	<ul style="list-style-type: none"> To what extent has the agency aligned its employee performance management system with its planned reform goals? How has the agency included accountability for proposed change implementation in the performance expectations and assessments of leadership and staff at all levels? 	●

Legend:

- **Substantially followed**—NWS took actions that addressed most or all aspects of the selected key questions we examined for the practice.
- ◐ **Partially followed**—NWS took actions that addressed some, but not most, aspects of the selected key questions we examined for the practice.
- **Not followed**—NWS took no actions that addressed the selected key questions we examined for the practice.

Source: GAO analysis of National Weather Service (NWS) documents and interviews with NWS officials. | GAO-22-105449

Examples of the five leading reform practices that NWS substantially followed include the following:⁹

Using data and evidence. Agencies are better equipped to address management and performance challenges when managers effectively use data and evidence, such as from program evaluations and performance data that provide information on how well a program or agency is achieving its goals.¹⁰ We found that NWS has used data and evidence from previous evaluations to inform its development of the

⁹For our findings on all eight reform practices, see [GAO-21-103792](#).

¹⁰[GAO-18-427](#).

Evolve Program. For example, as discussed previously, the agency used the results of the Operations and Workforce Analysis to help develop and justify the reforms it is pursuing under the Evolve Program.¹¹ In addition, NWS has used the results of its risk management process to help guide and improve the management and implementation of the Evolve reforms.

Managing and monitoring. Agencies must carefully and closely manage organizational transformations by developing an implementation plan with key milestones and deliverables to track implementation progress, among other actions.¹² We found that as part of its management of the Evolve Program, the PMO developed charters and schedules for the individual Evolve initiatives, which together serve as general implementation plans. In particular, the charters identify key deliverables that each initiative will produce, and the schedules identify key milestones. In addition, the agency highlights key Evolve-related deliverables and milestones that it plans to complete each year in the NWS Annual Operating Plan. The PMO and NWS leadership track implementation progress for the Evolve reforms through various mechanisms, such as quarterly program review meetings and monthly meetings with NWS senior leaders, according to agency documents and officials.

Strategic workforce planning. Strategic workforce planning is an essential activity for ensuring that an agency's human capital program aligns with its current and emerging mission and programmatic goals, and that the agency is able to meet its future needs.¹³ We found that NWS has conducted strategic workforce planning to help determine whether it will have the needed resources and capacity, including the skills and competencies, in place for its proposed reforms. For example, the agency released a strategic human capital plan in 2019 that outlines human capital-related changes it will need to make to help its workforce fulfill the vision of a weather-ready nation.¹⁴

¹¹For the results of the Operations and Workforce Analysis, see National Weather Service, *Operations and Workforce Analysis Catalog*, September 2017, accessed August 9, 2021, <https://www.weather.gov/owa-catalog>.

¹²GAO-18-427.

¹³GAO, *U.S. Secret Service: Action Needed to Address Gaps in IT Workforce Planning and Management Practices*, GAO-19-60 (Washington, D.C.: Nov. 15, 2018).

¹⁴National Weather Service, *National Weather Service Workforce for the Future Strategic Human Capital Plan 2019-2022* (2019).

However, we found gaps in the extent to which NWS followed other selected leading practices for effective agency reforms. Specifically, we found that NWS partially followed three leading practices, as follows:

Establishing goals and outcomes. Agencies should establish clear outcome-oriented goals to help identify what they are trying to achieve with their reform efforts and should establish performance measures to assess the extent to which they meet their goals.¹⁵ We found that NWS has established five clear outcome-oriented objectives that serve as the overarching goals for the Evolve Program's reform efforts, such as enhancing the quality and consistency of IDSS and improving the effectiveness of forecasting through a collaborative process. In addition, NWS has explicitly aligned the Evolve Program's reform efforts with the agency's mission and strategic plan, and it has described the Evolve Program's reform efforts as critical to the agency's ability to achieve its vision of a weather-ready nation.

However, NWS has not established performance measures for key elements of the Evolve Program's reform efforts, such as improving the provision of IDSS. The Evolve PMO has an initiative under way to develop performance measures related to IDSS, but the agency is still working to collect and analyze the necessary information. We have previously identified key attributes of successful performance measures, such as measurable targets, which help organizations track the progress they are making and assess whether performance is meeting expectations (see app. I).¹⁶ To help ensure that the agency can effectively assess the Evolve Program's performance and the extent to which the reform efforts are achieving their objectives, in September 2021 we recommended that NWS incorporate these key attributes, as appropriate, as it develops performance measures for the program's reform efforts. The Department of Commerce agreed with this recommendation.

Involving employees and key stakeholders. Agencies should directly and continuously involve their employees and other key stakeholders in the development of major reforms.¹⁷ We found that NWS has engaged its employees and the agency's employees union (known as the NWS Employees Organization) in a number of ways in developing the reforms

¹⁵[GAO-18-427](#).

¹⁶GAO, *Tax Administration: IRS Needs to Further Refine Its Tax Filing Season Performance Measures*, [GAO-03-143](#) (Washington, D.C.: Nov. 22, 2002).

¹⁷[GAO-18-427](#).

under the Evolve Program. For example, the Evolve PMO sends a quarterly email update to all NWS employees on the status of the Evolve Program's initiatives, presents information about the program on the agency's internal website, and has included some regional officials and weather forecast office employees on the teams responsible for implementing the initiatives. NWS has involved the NWS Employees Organization in certain Evolve initiatives, such as when it negotiated with the organization to reach an agreement on implementing a new career progression for forecasters. According to agency documents and officials, NWS has also taken steps to involve key stakeholders in its reform efforts, including by presenting information about the Evolve reforms at meetings for outside groups and developing surveys to collect information from external partners to help inform the development of IDSS-related performance measures.

Having a two-way continuing communications strategy for listening and responding to employee concerns regarding the effects of potential reforms is also important.¹⁸ However, we found that NWS does not have a communications strategy for the Evolve Program. The agency developed a partial draft of an Evolve communications strategy in 2019, but it has not yet completed this strategy, in part because it has focused on developing initiative-specific communications plans for certain Evolve initiatives, such as the new career progression for forecasters.

In the absence of a two-way communications strategy for the Evolve Program, we found that NWS's efforts to communicate with employees about the program's reforms have produced mixed results. Officials we interviewed from four weather forecast offices spoke positively about the agency's communications related to certain Evolve initiatives, such as the new career progression.¹⁹ However, officials we interviewed from six weather forecast offices raised concerns about the agency's Evolve-related communications, including that NWS has not sufficiently engaged and communicated with forecast office employees about the Evolve Program overall. The forecasters we interviewed had varied levels of awareness about the program and the Evolve PMO, with four forecast offices having at least one forecaster who had never heard of the PMO prior to our interviews. NWS officials told us that some employees are reluctant to embrace the Evolve initiatives and have concerns about the

¹⁸[GAO-18-427](#).

¹⁹We interviewed managers and forecasters from seven of the 122 NWS weather forecast offices for our September 2021 report. For more information, see [GAO-21-103792](#).

potential effects of the proposed reforms, including in some cases fears that the reforms could lead to office closures or job losses. Moreover, NWS Employees Organization representatives we interviewed said that they do not feel the agency has been transparent about its vision for the Evolve Program and that sending occasional emails and updating the agency's website about Evolve are not sufficient steps to obtain employee buy-in for the reform efforts.

As part of our September 2021 report, we also examined the agency's management of a project to develop a new weather modeling tool, and we identified similar concerns regarding communications about this project. The agency intends for this tool, known as the National Blend of Models (NBM), to provide a common starting point for the weather forecasting process to help reduce forecast inconsistencies across offices. The NBM development effort is included as one of the Evolve initiatives, giving the Evolve PMO a role in overseeing the project.

Officials we interviewed from NWS regional offices and selected national centers and weather forecast offices expressed mixed views on the effectiveness of the agency's communications about NBM.²⁰ Officials from four regional offices and three weather forecast offices praised some aspects of the agency's communications about NBM, such as the updates provided by the Meteorological Development Laboratory.²¹ However, the officials we interviewed also identified communications gaps. According to officials we interviewed from three regions and four weather forecast offices, NWS's communications have not sufficiently addressed the cultural challenges associated with implementing NBM, including some forecasters' resistance to using the new modeling tool and concerns among some forecasters that it could lead to job losses. Officials from one regional office said it would be beneficial if NWS leadership communicated more with employees in the field about leadership's expectations and vision for NBM, as doing so could help those who have struggled to embrace the new modeling tool.

As NWS completes development of the communications strategy for the Evolve Program, ensuring that the strategy incorporates approaches to

²⁰We interviewed senior officials from all six NWS regional offices and four of the agency's nine national centers. For more information, see [GAO-21-103792](#).

²¹NWS's Meteorological Development Laboratory leads the technical development of NBM, with overall oversight of the NBM project provided by the Evolve PMO as part of the Evolve Program.

listen and respond to employee concerns about NBM and other Evolve initiatives could help the agency better involve its employees in the Evolve Program and increase their understanding and ownership of the reform efforts. In our September 2021 report, we recommended that NWS should ensure that the final communications strategy developed by the Evolve Program is a two-way communications strategy that outlines how the agency will listen and respond to employee concerns about its reform efforts, including NBM. The Department of Commerce agreed with this recommendation.

Leadership focus and attention. Providing leadership focus and attention for agency reform efforts involves several things, including designating leaders responsible for implementation of the reforms.²² We found that NWS has designated three leadership positions as having primary responsibility for leading the overall implementation of the Evolve reform efforts, according to agency documentation. At the highest level, a member of the agency's executive council serves as the Evolve Executive Sponsor and has ultimate authority over the program. Below the Executive Sponsor, NWS has established a PMO Director position that has overall responsibility for the planning and implementation of the Evolve Program. Finally, the agency has established a PMO Deputy Director position to assist the Director in implementing and overseeing the Evolve initiatives and managing the PMO's day-to-day activities.

In addition to designating leaders, it is important to establish a dedicated implementation team that has the capacity, including staffing and resources, to manage the reform process.²³ We found that NWS has established the Evolve PMO to be responsible for managing the reform process.

However, we also found that the agency's approach to staffing the PMO's leadership and staff positions has hampered the PMO from functioning as a dedicated implementation team. According to agency officials and documentation, NWS has primarily relied on rotating staff to fill the various PMO leadership and staff positions.²⁴ For example, to fill the PMO Director position, the agency has used senior leaders drawn from other NWS offices for rotations designed to last approximately 1 year. From the

²²[GAO-18-427](#).

²³[GAO-18-427](#).

²⁴According to NWS officials, an exception to this rotational staffing is the Evolve Executive Sponsor, who has remained the same official since the start of the program.

time the agency first set up the Evolve PMO in late 2016 through June 2021, seven officials served as Director. According to NWS officials, the PMO Deputy Director generally rotates every 3 years, with two officials having served in the role as of June 2021. The agency has also followed a rotational approach to staffing other key PMO positions, including the staff leads for the five Evolve objectives and the staff leads for some of the teams managing implementation of the Evolve initiatives.²⁵ The staff leads for the Evolve objectives and members of the initiative teams consist of agency staff from various headquarters and field offices who mostly serve on a part-time rotational basis in addition to their regular duties.

Officials we interviewed from different levels within NWS expressed mixed views on how well the agency's approach to staffing the Evolve PMO's leadership and staff positions has worked. We interviewed six of the seven officials who have served as PMO Director, and they cited benefits of rotating the PMO Directors, explaining that doing so has brought a range of perspectives, skills, and experiences to the leadership of the Evolve Program. Similarly, officials we interviewed from one regional office, two national centers, and one weather forecast office said that rotating staff through the other PMO positions, such as the initiative teams, can help bring fresh perspectives into the Evolve Program.

However, officials we interviewed from NWS headquarters, regional offices, and selected national centers and local weather forecast offices, as well as the officials who have served as Evolve PMO Director, said that the agency's approach to staffing the PMO's leadership and staff positions presents challenges. For example, officials we interviewed from four regional offices and two national centers stated that the agency's approach to staffing the PMO has made it difficult to maintain momentum and focus. The officials explained that the frequent turnover in PMO staff results in more time being spent educating new staff about the initiatives, and in some cases, new staff have redone work completed by their predecessors, slowing progress on the reforms. Several officials also said that it is difficult for staff to balance their Evolve duties with their regular responsibilities and that providing greater stability in the staffing of the Evolve PMO would be helpful. According to one senior regional official,

²⁵The staff lead for each Evolve objective provides guidance to and oversight of the initiatives under the objective, among other things.

Evolve is one of the “most important things [NWS] is doing, but no one is assigned to do it.”

The PMO has identified similar concerns in Evolve Program documentation, stating that the “existing number of PMO staffing resources are not adequate to lead an effort of this size and importance. Current Evolve NWS PMO personnel are part-time, detailed, and rotating, resulting in increased transition overhead, disruption to continuity of projects, and increased risk of overall failure to evolve NWS.” NWS headquarters officials said that resource limitations led the agency to follow this approach to staffing the PMO. According to the officials, NWS has so far implemented the Evolve Program using available resources as part of a “build to budget” approach that largely relies on shared resources and personnel from other NWS offices.²⁶

Looking forward, NWS headquarters officials said that the agency has begun initial planning for the next phase of its reforms, an effort that the officials referred to as Evolve 2.0. The officials said that this next phase of the Evolve Program will require additional resources to implement, but NWS has not yet defined the scope of activities it plans to pursue as part of Evolve 2.0 or their associated costs. According to NWS officials, the Coronavirus Disease 2019 pandemic has hampered Evolve 2.0-planning efforts by decreasing the amount of time some personnel have available to support the Evolve Program. The officials stated that NWS hoped to resume planning for Evolve 2.0 by the end of fiscal year 2021.

Agencies are responsible for prioritizing their resources to meet their needs, and NWS’s work to define the scope of its future reform efforts and the resources needed to implement them provides an opportunity for the agency to revisit how it staffs the Evolve PMO’s leadership and staff positions. In our September 2021 report, we recommended that NWS revise its approach to staffing the PMO to improve leadership continuity, staff continuity, and the sufficiency of staff resources to effectively implement the Evolve Program’s reform efforts. The Department of Commerce agreed with this recommendation and stated that NWS will evaluate and adjust the staffing model for the Evolve PMO as part of the ongoing planning associated with Evolve 2.0.

²⁶According to NWS officials, the Evolve Program maintains a yearly budget of approximately \$1.0 to \$1.3 million, which primarily supports staff travel and contractor support for project management activities.

NWS Faces Staffing Challenges That Could Affect Its Reform Efforts

NWS's 2019 strategic human capital plan highlighted challenges NWS faces related to staffing levels, vacancies, and hiring that could affect the agency's resources and capacity to implement its proposed reforms. These are long-standing issues that have been highlighted in previous studies, including our May 2017 report.²⁷ For example, in that report we found that NWS's vacancies—unfilled positions at a point in time—across operational units that issue weather forecasts and warnings²⁸ increased from about 5 percent of the total number of positions at the end of fiscal year 2010 to about 11 percent in 2016.²⁹ Vacancy rates varied among positions. At the end of fiscal year 2016, the number of vacant meteorologist positions—including entry-level, general, and lead meteorologists—had increased by 57 percent (from 98 to 154 vacant positions) since fiscal year 2014. Over the same period, the number of vacant management positions decreased by 29 percent (from 42 to 30 vacant positions).

NWS operational unit managers and staff we interviewed for our 2017 report said they had taken a number of steps to address the impact of the vacancies, which remained unfilled for months and, in some cases, more than a year.³⁰ These steps included managers and staff performing additional tasks to ensure forecasts and warnings were issued, staff adjusting their work and leave schedules, and managers requesting temporary staff from other units. However, according to managers and staff we interviewed, taking these steps led, at times, to their inability to complete other key tasks, such as providing IDSS to state and local emergency managers. Officials also indicated that managers and staff

²⁷See National Academy of Sciences, Committee on the Assessment of the National Weather Service's Modernization Program, *The National Weather Service Modernization and Associated Restructuring: A Retrospective Assessment* (Washington, D.C.: National Academies Press, 2012); National Academy of Sciences, *Weather Services for the Nation*, 2012; and [GAO-17-364](#).

²⁸We defined 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) issues forecasts, (2) issues warnings, and (3) has personnel that are essential emergency employees. See [GAO-17-364](#) for more information.

²⁹NWS officials reported that they did not have the resources to fill all of these vacancies and therefore developed additional data that factored in available resources. Based on the data that factored in resources, the vacancy rate across operational units was approximately 0.6 percent in fiscal year 2010 and increased to about 7 percent in fiscal year 2016.

³⁰Agency data for fiscal year 2016 showed that the time it took to fill hiring requests once they were selected for processing averaged 232 days (around 8 months) and ranged from 64 to 467 days.

experienced stress, fatigue, and reduced morale resulting from their efforts to cover for vacancies.

In our September 2021 report, we found that these challenges continued. We reported that officials we interviewed from one NWS national center, one regional office, and five weather forecast offices identified challenges related to staff shortages and vacancies. According to NWS Employees Organization representatives we interviewed, staff shortages and vacancies may make it difficult for some offices to take on new work as part of the Evolve reform efforts, and the representatives called for the agency to conduct a staffing analysis to determine its staffing needs. Further, NWS's 2019 strategic human capital plan states that enhancing IDSS—a key objective of the Evolve Program—would require a workforce analysis to determine the optimal staffing profiles for NWS's offices. According to NWS headquarters officials, the agency is working with the NOAA Chief Financial Officer to review and analyze current and future staffing requirements as part of its workforce analysis to help inform future budget requests.

In conclusion, NWS has determined that reforming its operations and workforce is critical to achieving its mission. The agency has followed many leading practices in managing and implementing its reform efforts. Taking additional actions, such as those we recommended in our September 2021 report and which I discussed earlier in my statement, would further strengthen those efforts. However, NWS has also identified staffing challenges facing the agency that could affect the success of its reforms. Looking forward, continued attention to addressing these challenges could help to reduce the risk that they will impede the agency's reform efforts.

Madam Chairwoman Johnson, Ranking Member Lucas, and Members of the Committee, this completes my prepared statement. I would be pleased to respond to any questions that you may have at this time.

GAO Contact and Staff Acknowledgments

If you or your staff have any questions about this testimony, please contact Cardell D. Johnson, Acting Director, Natural Resources and Environment, at (202) 512-3841 or JohnsonCD1@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this statement.

GAO staff who made key contributions to this testimony are Jonathan Dent (Assistant Director), Joshua Wiener (Analyst in Charge), Tanya

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Appendix I: Key Attributes of Successful Performance Measures

Measuring performance allows organizations to track the progress they are making toward their goals and gives managers critical information on which to base decisions for improving their programs. Table 2 summarizes nine key attributes of successful performance measures we have previously identified and the adverse consequences that may occur if they are missing.¹ All attributes are not equal, and failure to have a particular attribute does not necessarily indicate that there is a weakness in that area or that the measure is not useful; rather, it may indicate an opportunity for further refinement.

Table 2: Key Attributes of Successful Performance Measures

Attribute	Definition	Potentially adverse consequences of not meeting attribute
Linkage	Measure is aligned with division and agency-wide goals and mission and clearly communicated throughout the organization.	Behaviors and incentives created by measures do not support achieving division or agency-wide goals or mission.
Clarity	Measure is clearly stated and the name and definition are consistent with the methodology used to calculate it.	Data could be confusing and misleading to others.
Measureable target	Measure has a numerical goal.	Cannot tell whether performance is meeting expectations.
Objectivity	Measure is reasonably free from significant bias or manipulation.	Performance assessments may be systematically over- or understated.
Reliability	Measure produces the same result under similar conditions.	Reported performance data is inconsistent and adds uncertainty.
Core program activities	Measures cover the activities that an entity is expected to perform to support the intent of the program.	Not enough information available in core program areas to managers and stakeholders.
Limited overlap	Measure should provide new information beyond that provided by other measures.	Managers may have to sort through redundant, costly information that does not add value.
Balance	Balance exists when a suite of measures ensures that an organization's various priorities are covered.	Lack of balance could create skewed incentives when measures over-emphasize some goals.
Government-wide priorities	Each measure should cover a priority such as quality, timeliness, and cost of service.	A program's overall success is at risk if all priorities are not addressed.

Source: GAO | GAO-22-105449.

Note: The information in this table was drawn from GAO, *Tax Administration: IRS Needs to Further Refine Its Tax Filing Season Performance Measures*, [GAO-03-143](#) (Washington, D.C.: Nov. 22, 2002).

¹For more information on these attributes, see GAO, *Tax Administration: IRS Needs to Further Refine Its Tax Filing Season Performance Measures*, [GAO-03-143](#) (Washington, D.C.: Nov. 22, 2002).

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Cardell Johnson is an Acting Director in GAO's Natural Resources and Environment (NRE) team. He oversees work on the federal government's management of public lands and water resources, including national parks and forests, mineral resources, coastal and marine resources, endangered species, water supply, and National Weather Service programs.

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