DEPARTMENT OF THE AIR FORCE

SUBCOMMITTEE ON THE ENVIRONMENT
SPACE, SCIENCE, AND TECHNOLOGY COMMITTEE
UNITED STATES HOUSE OF REPRESENTATIVES

SUBJECT: Weather Satellite Systems and Weather Forecasting Capabilities

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Introduction

Chairman Bridenstine, Ranking Member Bonamici, and distinguished members of the Subcommittee, thank you for this opportunity to discuss Air Force's weather satellite systems and weather forecasting capabilities. Thank you for the opportunity to join Dr. Stephen Volz from the National Oceanic and Atmospheric Administration (NOAA). We, at the Air Force, welcome your interest and the opportunity to discuss these important topics.

The purpose of my testimony today will be to highlight the Air Force weather forecasting capability and operational use of weather satellite systems.

Weather Satellite Programs

The Air Force relies on an international family of systems of geostationary (GEO) and low-earth orbiting (LEO) satellites to provide global meteorological coverage. This family of systems impact operational missions such as remotely piloted aircraft (RPA), close air support, Special Forces, and airborne and space-based intelligence, surveillance and reconnaissance (ISR) assets.

In 1962, the Defense Meteorological Satellite Program (DMSP) was first flown to support National Reconnaissance Office (NRO) operations. Over the years, the program was transferred to the Air Force and has flown in both early and mid-morning LEO orbits. Today, DMSP is flown in the morning orbit per the National Space Policy (2010).

In accordance with a Deputy Secretary of Defense memo, the Air Force will not take actions regarding DMSP-20 that might preclude inclusion of the satellite in the set of alternative solutions under consideration for addressing satellite-based environmental monitoring (SBEM) requirements until after September 1, 2016. If the Department decides to launch DMSP-20 in order to meet SBEM requirements, it is recognized that we will need to work with Congress to request permission and obtain the necessary legislative authorizations and appropriations.

The Air Force remains focused on executing a two-phased acquisition approach for the Weather Satellite Follow-on (WSF) program to meet the remaining three Joint Requirements Oversight Council (JROC) validated materiel requirements for SBEM: Ocean Surface Vector Winds (Gap 3), Tropical Cyclone Intensity (Gap 8), and Energetic Charged Particle characterization (Gap 11). The Operationally Responsive Space (ORS) office will work with the Space and Missile Systems Center Remote Sensing Systems Directorate (SMC/RS) to develop and launch a technology demonstration (designated ORS-6) focused on the nearest term Gaps (3 and 8) in September 2017. For Phase 2, the current plan is to launch an operational WSF objective system to fully meet the three JROC-validated materiel requirements by 2022.

The DoD and Department of Commerce have enhanced their efforts to manage the family of systems risks by elevating the level of interaction to the Under Secretary of the Air Force, Space and the Office of the Secretary of Defense (Policy) (OSD(P)) at a senior executive level. The Air Force connects with NOAA on use of U.S. assets, and the OSD(P) office engages with them on international partnership advocacy. These interactions occur on a continuing basis to ensure pertinent weather information is available over the long-term.

Air Force's Weather Capabilities and Partnerships

The Air Force is one of the few organizations within the U.S. Government that has a global forecasting responsibility. Our meteorological production is more than just providing aviation weather services. We provide global weather and climate information to the Air Force, Army and Intelligence Community. Our Combatant Commanders demand timely, reliable, and actionable meteorological information, on both unclassified and classified networks, so they can understand the environmental impacts that affects all phases of military operations. Additionally, we are called to provide weather lead nation capabilities to our coalition and allied partners. We also take

seriously our role of providing our model data and observations to our United States partners in order to improve the nation's weather forecasting capabilities.

We've seen demand for our products and services increase as decision makers look for tools and information to help them better understand risk and prepare for the future. This will require us to receive more observations to improve our numerical weather prediction models to meet increasing demands for more accurate and reliable forecasts and warnings.

While our computer predictions have improved, it is the dedication of our skilled Airman that make it all possible. Our Total Force Airmen are trained and educated on terrestrial and space weather impacts to the warfighting mission. We strive to minimize the impact of weather threats to friendly forces while simultaneously capitalizing on weather conditions that maximize the operational advantage over enemy forces. We must consider the full range of weather operations from climate to microscale weather events, prepared to support operations ranging from Humanitarian Assistance in partnership with departments outside the DoD, local field training events, to theater campaign plans, and major contingency operations exploiting our capability. Our Airmen use Air Force tactical sensors to develop an environmental picture of the battle space and minimize our data gaps. We deploy alongside and embed with Air Force fighter squadrons, Army battalions, and Special Forces Groups to ensure the warfighter completely understands the environmental impacts to their missions. We also produce data on classified models to ensure operational security and assessment on foreign capabilities. Air Force personnel uses military tactical decision aids to correlate platform or sensor degradation with weather impacts. Our data is also fed into DoD command and control systems to ensure planning and operational impacts are mitigated or minimized.

Today's world dynamics drive us to deliver more precise forecasts and assessments. Our ability to monitor environmental changes are based on timely access to data with necessary assurances that we can trust the data. These data are used by our global short-term terrestrial and space weather forecasting systems. The more data we receive, the better our predictions and impact assessments become.

We receive data from our coalition and North Atlantic Treaty Organization (NATO) partners through cooperative engagements. Additionally, we incorporate interagency and commercial data so we can focus our capabilities for the global mission. A global satellite and in situ system of systems are necessary to provide us insight into weather affecting military operations worldwide over the course of a few hours, days or weeks in advance.

We have partnerships with academia and private sector for research on specialized models such as clouds and aerosols for military unique requirements. Once we receive the information within our networks, we work to ensure we can maintain our capabilities during times of crises.

Today, the Air Force has several operational agreements with NOAA which covers our continental United States Doppler radar network, exchanges of data and meteorological satellite information, and National Weather Service's continuity of operations plans. We also participate on numerous committees and working groups throughout the federal enterprise. With any organization, we could always improve our communication within the enterprise.

Future Capabilities

We are building a unified framework, which is a scalable system, which allows us maximum flexibility to run higher resolution areas, short term forecasts, and longer term forecasts for mission planning. We recognize we need to continue to improve our capabilities for areas such as remote piloted aircraft, urban operations, space weather observations and warnings, trafficability of land

forces, global water assessments, and land surface information. We must plan for changes in our future weather support for the next generation capabilities and needs, and the Air Force weather community needs to be quick, flexible and agile. We need the ability to assimilate our own unique military datasets from ground and aerial platforms, our organic environmental sensors, and sensors on soldiers.

In the future, we do foresee commercial providers potentially providing an essential element of data and information within our enterprise. Before we incorporate any data, organic, public or commercial, into our models and observational assessments, we must ensure that the data is accurate, reliable, and can be validated so that the accuracy of our operational forecasting models do not suffer. The Combatant Commander wants assurance from us that we are providing the best weather and climate information for the decision-making process. Our capabilities must precisely and predictively provide the right data and information, in the right amount, at the right time, especially since DoD will continue to face an increasingly complex global security environment.

CONCLUSION

The Air Force weather community is a vital component of the Department of Defense and the U.S. Government to ensure our military forces possess a meteorological asymmetric advantage over our adversaries, mitigate risks, and become more resilient from the effects of weather. We must prepare to continue to show initiative, be adaptable, and be innovative to allow weather operations to provide relevant knowledge, data, and information to the Joint Warfighter in this increasingly complex world.

The Air Force remains committed to ensuring our capability supports our global national security objectives. Our warfighters deserve our absolute best and we intend to provide it to them. I am proud of our in-garrison and deployed weather Airman who deliver critical products and

services every day to help keep our military safe and mitigate the environmental impacts to our sensors and platforms.

Thank you again for the opportunity to testify before you today. I am happy to answer any questions you may have.