

**NOAA Response to the  
Science Advisory Board's  
REPORT CONCERNING RADAR GAPS**

**March 2024**

## EXECUTIVE SUMMARY

### REPORT CONCERNING RADAR GAPS

The Environmental Information Services Working Group (EISWG), an advisory working group reporting to the National Oceanic and Atmospheric Administration (NOAA) Science Advisory Board (SAB), provided the Report on Radar Gaps to the SAB in November 2023. This report concerned NOAA's progress and prioritization of a major recommendation in the 2021 Priorities for Weather Research (PWR) report for NOAA to immediately start filling gaps in NEXRAD network radar coverage with low-cost radars, while planning for the next post-NEXRAD network. The Report on Radar Gaps provided three recommendations to NOAA to improve coverage over underserved and vulnerable communities using gap-filling radars and collaborations with industry.

This document provides NOAA's response to the Report on Radar Gaps.<sup>1</sup> NOAA appreciates the EISWG members for providing their detailed recommendations. For each recommendation, current actions underway along with future activities planned by NOAA that address the recommendation are described. As can be seen in the individual responses, NOAA largely concurs with the recommendations. In some instances, additional resources need to be made available in order to adequately address the recommendations.

### **NOAA Responses to Specific Findings and Recommendations**

#### **Summary Recommendations**

Recommendation 1. Establish a gap-filling radar data framework strategy: Using the [EISWG Report \(A NESDIS Observing System Backbone Framework\)](#) define a radar backbone architecture that will best serve the Nation.

NOAA Response: NOAA concurs with this recommendation. In the short term, the National Weather Service is working with the Office of Oceanic and Atmospheric Research to enlist outside expertise to help define what the ideal backbone framework looks like and the trade space to be considered. NOAA is also formulating the Radar Next program. If funded, this program will define a backbone radar architecture that will best serve the Nation, including addressing the present gaps in radar coverage and the needs of vulnerable and underserved populations. The architecture will also include the networking and communications necessary to deliver and disseminate the data, along with the technology to integrate heterogeneous radar systems in real-time for use in operations and distribution to the weather enterprise and public.

Recommendation 2. Use commercial data already in hand: NOAA should act now to more fully leverage available commercial radar data, expand it, and use it directly in operations. For any radar data NOAA acquires commercially and uses within NOAA operations, thus incorporating them into the country's foundational weather data, NOAA should also acquire the appropriate license to distribute the data on an equal-opportunity basis at no cost to the end user, in the same

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<sup>1</sup> [https://sab.noaa.gov/wp-content/uploads/SAB\\_Report\\_Nov2023\\_EISWG\\_Radar-Gaps.pdf](https://sab.noaa.gov/wp-content/uploads/SAB_Report_Nov2023_EISWG_Radar-Gaps.pdf)

format and with the same timeliness as it would have done if the radar data originated from NOAA-owned and NOAA-operated equipment.

NOAA Response: NOAA concurs with this recommendation. As of January 2024, NOAA is purchasing data from 20 radars for demonstration purposes under the National Mesonet Program. Furthermore, NOAA has participated in a Cooperative Research and Development Agreement with Climavision since May 2022 to analyze their X-band radar data for use in the Multi-Radar Multi-Sensor system to improve precipitation estimates when combined with NEXRAD and other observations. In September 2023, NOAA expanded this collaboration with Climavision to include a 6-month evaluation of 13 Climavision X-band, dual polarization radars across the country. The evaluation includes the examination of the data by NWS operational forecasters at several Weather Forecast Offices and the Storm Prediction Center, as well as radar meteorologists at the Radar Operations Center, to determine the suitability of the data for use in operations. Understanding the impacts of attenuation, data quality, and other radar properties are particularly important during the evaluation period. The outcome of this analysis will inform NOAA's future strategy for incorporating commercial radar data into operations.

NOAA will continue to explore the purchase of supplemental radar data from the commercial sector, universities, and state/local or public-private partnerships in an effort to improve radar coverage gaps, including across underserved and vulnerable communities. The amount of data NOAA can purchase will depend on the price point and resources available under the National Mesonet Program. The Radar Next program will examine the feasibility and cost of distributing data from non-federally owned radars into the national data stream. NOAA shares the policy objective of making data open generally, and will attempt to do so here, while recognizing that increased costs may make it infeasible.

Recommendation 3. Act immediately to implement a gap-filling radar strategy: Using X-band and C-band radars (e.g., commercial data purchases and/or NOAA-deployed backbone), prioritize coverage of, and engagement with, underserved populations.

NOAA Response: NOAA partially concurs with this recommendation. The gap-filling strategy in Recommendation 1 will have to be developed first before Recommendation 3 can be implemented. Design and implementation of a backbone radar network architecture will be dependent on available funding and resources through the Radar Next program. However, in the short-term, along with current actions to purchase supplemental radar data through the National Mesonet Program and working with commercial entities such as Climavision, NOAA has also lowered elevation angles at 19 radars, with another 8 planned for implementation in 2024. The lower elevation angles (below 0.5 degrees) provide expanded low-level coverage for detection of hazardous weather in locations vulnerable to flash flooding, tornadoes, severe thunderstorms, hurricanes, and winter storms. NOAA is formulating the Radar Next program, which, if funded, will include a national strategy for filling radar coverage gaps across the country. The Radar Next program will engage with federal, state, local, and tribal/sovereign nation officials, emergency managers, academia, and industry to ensure vulnerable and underserved communities are represented in the development of program requirements and the future national radar strategy. Modern technologies, such as gap-filling X- and C-band radars, electronically steerable

radars, mobile radars, and improved data processing will be considered. Current funding levels are insufficient to substantively change the current national radar coverage beyond limited radar data purchases through the National Mesonet Program and the implementation of lower elevation angles at a few select NEXRAD sites. In the long term, the Radar Next program, if funded at required levels, will enable NOAA to dramatically improve and enhance national weather surveillance radar capabilities, including geographic coverage, low level wind and precipitation detection, and the creation and distribution of improved data products.