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Shapiro Administration Highlights Upgraded Weather Monitoring and Alerting System that Aligns with new K-12 Education Curriculum

Collaborative efforts between Commonwealth Agencies, Penn State University, local schools, and federal partners leads to greater public safety through a more robust weather monitoring and alerting system and stronger education efforts for K-12 students Commonwealth-wide.

Greencastle, PA – Today, **Pennsylvania Emergency Management Agency (PEMA) Director Randy Padfield** joined officials from Greencastle-Antrim School District, Penn State University, National Weather Service, and state legislators to showcase collaborative efforts to update and enhance the **Pennsylvania Integrated Flood Warning and Observation System (IFLOWS 2.0)**. The IFLOWS 2.0 provides real-time weather information and alerting tools to emergency managers, meteorologists, and the public at sites across the Commonwealth through the Keystone Mesonet.

The IFLOWS 2.0 system upgrade project is being completed through a partnership with Penn State University. A total of 30 new weather stations will be installed across the Commonwealth through August 2026, with most being placed on school properties. The network upgrade will better supply the National Weather Service and emergency managers with the information they need to keep the public safe from severe weather and flooding through early alerting.

“Flooding is the top natural hazard in the Commonwealth, and enhancing detection and providing early warning are critical tools to prevent loss of life,” said **PEMA Director Randy Padfield**. “The enhancement of the IFLOWS will provide emergency managers and forecasters advanced notification for conditions that may lead to flooding or other natural hazards, giving the public extra time to take safe action.”

Known as the Pennsylvania Environmental Monitoring Network (PEMN), these 30 new weather stations will tie into Penn State’s recently installed weather network of 20 stations, for a total of 50 high-quality weather sensors across 38 counties. The PEMN is supplemented by other weather data being provided to the Keystone Mesonet from the **Pennsylvania Departments of Transportation**, **Conservation and Natural Resources**, and **Environmental Protection**, **Pennsylvania Turnpike Commission**, **Federal Aviation Administration**, **National Oceanic and Atmospheric**

Administration (NOAA), and **University of Delaware** (sites in Chester County, PA) to provide a greater density of weather monitoring, a collaborative effort between partners to share critical weather data for enhanced public safety.

“At Penn State, we are proud to collaborate with PEMA and our partners across the Commonwealth on this important effort to improve public safety and education through enhanced weather monitoring,” said **Penn State University’s Head of the Department of Meteorology and Atmospheric Science Dr. Paul Markowski**. “The Pennsylvania Environmental Monitoring Network exemplifies the land-grant mission of Penn State — applying science and technology to serve our communities. These weather stations not only strengthen Pennsylvania’s capacity to respond to severe weather but also provide unique educational opportunities for K–12 students to engage with real-time data in their own backyards.”

The National Weather Service relies on real-time weather information throughout the Commonwealth to assist with issuing weather warnings and forecast products. The access to rain and wind data in remote areas can assist with providing more timely severe weather warnings to provide the public with life-saving information to take action.

"Quick access to reliable weather observations is essential to the National Weather Service forecast and warning process,” said **National Weather Service State College Meteorologist-in-Charge Ashley Evans**. “Real-time observational data provided by these new IFLOWS stations help to provide our forecasters with timely information to issue warnings, so our partners and the public have as much lead time as possible to prepare, make decisions, and take necessary action to protect lives and property due to impacts from any weather event."

Additionally, a team from Greencastle-Antrim School District continues to develop a state standard-based K-12 weather curriculum with Penn State University, which is free for use by public, private, charter, and homeschool educators across the Commonwealth. The new K-12 curriculum uses the weather data from the IFLOWS 2.0 system as part of the PEMN run by Penn State University to teach concepts in science, technology, engineering, and math (STEM) with real-world applications.

“We are so fortunate to be able to have one of these weather stations installed on our campus,” said **Greencastle-Antrim School District Superintendent Dr. Lura Hanks**. “Our students will benefit from opportunities to use the same data forecasters are using to study weather patterns and will develop an understanding of the relationship between the many partners using the data to help us all plan for weather events. We are excited to continue our work as we build our district’s environmental literacy plan so our students have a comprehensive understanding of our earth, and the steps they can take to care for it.”

Since many of the weather stations are installed on school district properties, students and staff can physically see the equipment that gathers the weather data they will use in

their classroom. Students will further understand how the data they are using ties to their local weather patterns.

“Providing students with access to hands-on educational experiences with real-world applications enables them to take their learning from classroom to career—and in this case, from classroom to community,” said **Acting Secretary of Education Dr. Carrie Rowe**. “This unique program uses collaboration and partnership to assist forecasters and emergency responders; keep Pennsylvanians safe; and create meaningful, engaging learning opportunities for students across the Commonwealth.”

Title 35 of the Pennsylvania Consolidated Statutes requires PEMA to implement a “program of integrated flood warning systems” and to “provide early warning systems” in the Commonwealth. The original IFLOWS system developed in the 1970s and 1980s has been upgraded with a new network of sensors and uses data from other established networks across the Commonwealth to accomplish this legislative mandate for early warning.

The IFLOWS 2.0 upgrade is funded through a **$720,000** grant from the Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program (HMGP). The HMGP grant, awarded in December 2022, allows communities to plan for and implement sustainable cost-effective measures designed to reduce the risk to individuals and property from future natural hazards, which includes early alerting systems. FEMA has provided 90 percent of the project funding, with a local match of 10 percent paid by the Commonwealth. PEMA is administering this grant through an agreement with Penn State University.

A **$172,500** grant from the FEMA Pre-Disaster Mitigation (PDM) Program, awarded to the Commonwealth in March 2021, provided funding to research and plan for the placement of the IFLOWS 2.0 sites which is being used as guidance for the site installations. PEMA administered this PDM grant through an agreement with Penn State University. FEMA provided 75 percent of the funding with the Commonwealth covering the remaining 25 percent.

In 2022, Greencastle-Antrim School District was awarded a **$499,192** PAsmart Advancing Grant from the **Pennsylvania Department of Education**. The grant funded a project to develop a weather curriculum to share with school districts around the state. Additionally, the district was able to use this grant to design a STEM curriculum that builds on community-developed core competencies, to create an outdoor STEM learning space for both school and community, to provide free STEM programming in local public libraries, Pre-K and YMCA programs, and to train pre-service teachers in STEM education.

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