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Committee on Science, Space, and Technology
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Advancing Commercial Weather Data: Collaborative Efforts to Improve Forecasting

Mr. Chairman, Ranking Member Bonamici, and Members of the Subcommittee, thank you for the opportunity to testify today. My name is Thomas Bogdan. I serve as the President of the University Corporation for Atmospheric Research – or UCAR.

UCAR is a nonprofit consortium of 105 member universities granting degrees in atmospheric and related earth sciences. UCAR's primary activity is to manage, on behalf of the National Science Foundation, the National Center for Atmospheric Research (NCAR) and UCAR's Community Programs.

NCAR is a Federally Funded Research and Development Center with over 500 scientists and engineers conducting weather and atmospheric research, and staff that manages supercomputers, research aircraft, and Earth observing systems. Our UCAR member universities and staff scientists conduct research for use by government and the private sector to further our understanding of atmospheric phenomena, and help to create more accurate weather forecasts across the nation.

As noted by the Chairman, robust data streams from multiple observing systems are essential if we are to maintain an up-to-date information system that will enable us to predict weather and other environmental changes accurately. This is particularly important for dealing with extreme weather events like tornadoes, hurricanes, floods, snow storms or extended drought conditions.

The essential data come from a variety of sources including the Federal Government, our universities, international observations, commercially owned and operated sources, from a variety of industries, and via aerial and ground based observing systems. And today's sources for data and observations are only the beginning.

Every car traveling our highways with their GPS system could be used to collect and transmit localized weather observations; ships and even pleasure craft can serve the same purpose to collect maritime weather and oceanographic data. The ever-present cell phone with the right sensor can become a barometer, a hygrometer that measures humidity, and

a thermometer. Under the right circumstances, data collected from many phones could create a network of millions of inter-connected weather stations.

Developments in instrumentation, monitoring, computational resources, and communication capabilities offer opportunities to supplement the vital data collection efforts of the Federal Government. The result will assist in the continued improvements in the accuracy of short and longer-range forecasts that we could have only dreamed about just 20 years ago.

While the opportunities and sources for data collection are expanding, we must continually invest in research to ensure that the data are robust, accurate, and meet the required standards for quality, continuity, and reliability. After all we are relying on data and observations to save lives and protect property.

Then there is "big data." NCAR and the UCAR universities have been gathering, modeling, analyzing, sharing, and yielding discoveries from big data for decades. When our Supercomputing Center opened two years ago, its 1.5-petaflop computing system was ranked among the 20 fastest in the world. With increasing amounts of open access data and the power to process it, we have the capability to dramatically increase the accuracy of forecasts and expand the warning time for severe storms. And that means we will save more lives, protect more livelihoods, and increase the economic resilience of where we live and where we work.

NOAA and the private sector are investing in data that will lead to improved forecasts and better protection of our lives and property, as well as a source of economic growth. NOAA produces an estimated 20 terabytes of data – that is twice the size of the entire printed collection of the Library of Congress every day. NOAA has embarked on a process to dramatically increase public access to these data and for this they should be applauded. There will be expanded opportunities for scientific advancement with NOAA's release of these data streams as well as economic opportunities pursued through the ingenuity of the private sector.

The value of big data was demonstrated with Hurricane Sandy. Three days out, forecasters predicted within 10 miles where landfall would occur. Twenty years ago, forecasters might not have been able to predict the unconventional left hook the storm took into the New Jersey coast. Thanks to the speed and power of our computational systems, the access to vast amounts of data from the many different observing systems, and our ability to turn all that information into actionable intelligence surely saved thousands of lives and provided the opportunity to minimize damage.

Critical to scientific innovation and advancement in atmospheric research is the availability of accurate and precise data; computational resources to process and model the information; and an educated and trained workforce who can interpret and utilize this information. Combined correctly this will drive science forward and will improve the accuracy of the daily, weekly, and seasonal forecasts.

In closing, I would like to suggest three overarching principles that the subcommittee consider as it works through public policy for commercial weather data.

First, essential atmospheric data must be high quality, consistently generated, and remain in the public domain to meet societal goals of resilience and the protection of lives and livelihoods. Furthermore, it is advantageous to provide the private sector with data and decision support systems. Accelerated innovation and technological advances that the private sector can provide further serves the public interest.

Second, public access to data is essential for science to advance. Data openly available to the scientific community provide opportunities for widespread review and analysis that drive innovative science and economic opportunities.

Third, we must embrace the benefits we receive by the reciprocal sharing of data and observations, and collaboration with our international colleagues. At the present time, we have access to vital data and observations made by colleagues in Europe and elsewhere. This information is vital for the modeling and forecasting by the public, universities and private companies.

Our ability to gather, process, and transfer observational and computational data is transforming our understanding of the natural world in ways that offer enormous benefits to society. Only within the last 20 years have we reached a point where we can do this kind of science on a global scale. Access to and use of this information has never been easier given the development of new technologies, new observing platforms, and advanced computational and communication technologies. We need to continue to make data available for public and private scientific research that will improve forecasts and better protect the public and our economy.

I appreciate very much the opportunity to participate in this hearing and would be glad to answer any questions.

Thank you.