U.S. Government Response: Fighting Ebola and Protecting America

STATEMENT OF

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Introduction

As the Founder and CEO of Earth Networks, I appreciate the opportunity to provide outside witness testimony to the Senate Committee on Appropriations regarding the U.S. Government response to the Ebola outbreak. We commend the Committee Chair and Members for your vision to welcome outside testimony from a broad cross-section of organizations that are working on the Ebola response, both domestically and abroad. In order to further prevent the spread of this virus, it is vital to establish a comprehensive and multi-disciplinary response plan that, protects front line public health personnel, leverages existing technology and maximizes limited resources.

Earth Networks is a Maryland based company and our particular expertise is operating large, dense environmental and atmospheric sensor networks. We utilize the data from these observational networks to deliver daily environmental information and alerting to millions of consumers; federal, state and local governments; and the myriad of industries impacted by weather. Earth Networks currently delivers environmental data and products to numerous US federal agencies, including global lightning data to the Department of Defense.

Weather intelligence is a critical factor that, while not typically 'top-of-mind' when considering public health initiatives, directly affects the proficiencies and effectiveness of these plans. Weather is having a greater impact on the world's societies than ever before. This includes impacts to the global economy as well as the property and lives of humans everywhere. Least developed nations in particular are highly vulnerable to the effects of these phenomena given their exposure to the elements and the lack of infrastructure for weather observing, forecasting and the provision of adequate warnings. Similarly, response initiatives including those of our own governments are extremely sensitive to these same threats and thus negatively impacted by and often unable to adequately address the dangers they are conceived to address.

Efforts to combat the Ebola outbreak currently ravaging parts of Western Africa and threatening to expand globally are no exception. Infrastructure, including weather information, in this part of world is wholly lacking. Up until recently, repeated initiatives to enhance monitoring and forecasting capabilities have failed due to a variety of reasons, but primarily due to the substantial challenges associated with the maintenance of observational networks. Today, however, with rapidly advancing electronics and communications technologies as well as innovative business strategies including partnerships among public, private and academic entities this current condition is poised for rapid change.

A Comprehensive and Robust Observing System

Western African nations including; Liberia, Sierra Leone, Guinea, Guinea-Bissau, Gambia, Senegal and others represent one of the least developed regions in the world and these countries lack much of the infrastructure considered necessary to sustain even basic societal capacities. As such, these countries are highly susceptible to a wide range of threats including disease, malnutrition and the effects of extreme weather. Earth Networks has successfully formulated innovative collaborations that have enabled organizations to cost-effectively modernize crumbling infrastructure or establish new capabilities where none had previously existed. This includes the establishment and continued operations of networks with associated comprehensive tool sets for decision support in not only developed nations, but also in the developing and least developed world including Western Africa.

Earlier this month, Earth Networks was contacted by the United States Air Force regarding the availability of additional weather information including watches and warnings in Western Africa for the protection of resources including personnel and logistical assets. Earth Networks has been actively engaged in the development of such capabilities throughout this region for the past several years and possesses ready infrastructure in this regard. In 2013, Earth Networks established a weather demonstration project in West Africa, undertaken through an innovative public-private partnership that employs transformative and scalable technology to provide comprehensive end-to-end solutions and the continuation of this project is critical to the support of public health infrastructure in the countries most directly impacted by the Ebola crisis.

To date, Earth Networks and our Guinean partners including Cellcom Guinee SA have provided all of the resources required to establish, train, operate and maintain this capability at no cost to The Republic of Guinea. The system has proven highly useful to the Guinea National Meteorological and Hydrological Service and related emergency response decision makers as it has successfully monitored, tracked and delivered, for the first time ever in this part of the world, precise weather and storm warning information in real-time. With sustained efforts and eventual expansion, this wide-area early warning and weather monitoring capability will continue to deliver highly relevant information to promote the development of each of Guinea's and its neighboring country's primary economic areas including:

- **Emergency Preparedness and Response –** the protection of life and property;
- **Disaster Risk Reduction** – ability to automatically alert at local levels in real-time;
- **Flood and Drought Conditions** – flash flood and precipitation monitoring;
- **Water Resource Management** – precipitation impacts on water reserves;
- **Food Security** – key input to and optimization of agricultural applications and practices;
- **Public Health** – Protection for open-air facilities and forecasting for airborne illnesses;
- **Energy Security** – hydropower, electrical grid stability, power outage management;
- **Transportation Operations** – flight safety, air traffic control, ground crew operations;
- **Economic & Infrastructure Development/Planning** – localized storm and rainfall statistics.

Information of this type is critical for establishing a society that is both resilient to threats and sustainable over time. This capability and associated services are also perfectly emblematic of and highly complementary to efforts announced by the US government by:

- Equipping Meteorologists in Developing Nations with the Latest Tools and Knowledge;
- Launching a Public-Private Partnership on Climate Data and Information for Resilient Development; and
- Complementing the Power Africa Cooperation Agreement for renewable energy.

The Need For Local and Regional Weather Infrastructure

There are three primary reasons this capability is highly relevant to a safe and effective U.S. Ebola response in West Africa:

- Supporting Critical Health Infrastructure
- Supporting US Military and Civilian Personnel
- Supporting Least Developed Countries Economic Resilience

First, because existing in-country critical care health infrastructure is limited in West African nations affected by Ebola outbreaks, there are few dedicated buildings that house medical clinics or hospitals, especially outside of urban areas. This means larger scale testing and treatment interventions must occur outdoors and/or in temporary shelters. The Department of Defense will soon be deploying mobile testing labs that must both navigate more-often flooded and unpaved roads, and frequently rely on tents to provide "shelter" for patients and doctors. Especially during the "rainy seasons", it is critical to know when severe weather is imminent, in that such information often dictates when and where travel can occur on unpaved roads, and whether or not it is safe to set up temporary shelters to test and treat people.

Second, the US has committed substantial resources including military and civilian personnel to conduct humanitarian support operations in the West Africa region and which involves considerable logistical support and coordination. These operations include the use of fixed wing aircraft, helicopters and a myriad of ground vehicles. As we are keenly aware in the US, all transportation operations, and particularly the safety of those operations, are significantly impacted by weather. This is one of the primary reasons that the US has and continues to invest tens of billions of dollars in its weather infrastructure. Conversely, it is well known that Africa possesses little or no weather infrastructure. This is particularly true in Western Africa where there are no reliable surface weather observation networks, no operational weather radars, and no severe weather warnings are issued. For these reasons, air travel in Africa, is widely considered to be the most dangerous in the world as exemplified by the recent Air Algiers disaster. Early indications are that this plane simply flew directly into a severe storm that was not tracked due to the lack of weather information. In 2012 the National Transportation Safety Board issued a recommendation to the Federal Aviation Administration that total lightning data be integrated into all aspects of the US National Airspace System due to its utility in identifying dangerous and impactful conditions. This recommendation was based on use of data collected from the exact same technology currently deployed in Guinea. It is imperative that our own military and support personnel are not exposed to these same risks especially when a system is in-place that will substantially mitigate these dangers.

Third, weather infrastructure is a key component to our efforts in assisting West African countries to cope with the toll the disease is taking on their respective economies. The President has stressed that these nations must not be cut off from the rest of the world to both allow supplies and personnel to move effectively and because such actions would further harm their already fragile economies. In Guinea specifically, agriculture accounts for 24% of the total GDP and employs 84% of the economically active population. Successful agricultural production is highly sensitive to weather events and the agricultural sector in Guinea stands to benefit significantly from the weather monitoring and forecasting tools afforded by the partnership mentioned previously. These West African countries are already "net food importers" and UN officials have recently reported that up to 40 percent of farms have been abandoned in the worst affected areas of Sierra Leone and there are already food shortages in Senegal and other nearby countries because regional agricultural production and trade has been disrupted. As such, it is important for farmers in Guinea and elsewhere who can continue to bring crops to market during the Ebola crisis to have basic tools to ensure that severe weather events do not cripple their agricultural production.

Conclusion

Recently, the US government announced several initiatives focused on enhancing the resiliency and sustainability of developing nations. Chief among these efforts are the need for data tools and services that address extreme weather risk reduction to help avoid loss of life and property, support renewable energy sources, enhance agricultural yields and better prepare their citizens for ever increasing environmental threats.

Ensuring the continuation and regional expansion of the existing capability described herein will enable the United States to continue leading international efforts to enhance the resiliency of vulnerable nations and also provide a valid model for other developing nations that desperately need assistance. The information derived from the system is also vital to enhancing the effectiveness of US relief efforts and safety of our military and civilian support personnel. This innovative technology has been successfully implemented and proven within the United States by several Federal agencies including; NOAA, DOD, DOT, and NASA, numerous academic institutions such as; the University of Oklahoma, University of Maryland, Florida State University and Texas Tech University, as well as numerous domestic commercial entities that have leveraged its outputs. Additionally, many other developed and developing nations such as Australia, Brazil, and India have adopted this capability for their weather system modernization efforts.

West African nations along with many other least developed countries have the opportunity to immediately benefit from this proven and impactful capacity building technology. Additional information describing the project's status, successes and applications as well as end user perspectives can be found in a white paper authored by Dr. Mamadou Lamine Bah, National Director of Guinea's Direction Nationale de la Meteorologie and President of the Regional Association 1 (Africa) for the World Meteorological Organization. Dr. Bah has also attended several conferences throughout Africa and the United States speaking to the systems benefits, effectiveness and need for continued support and proliferation throughout the region.

Earth Networks and Cellcom Guinee SA have financed this system's operations entirely until now. However, the demonstration project and network associated benefits will end in December 2014 without material financial support. As the US government considers efforts to support the physical infrastructure necessary to sustain health system interventions critical to mitigating the spread of Ebola, we believe that this weather system's operations and regional expansion should be high on the list of items for financial consideration. The network capability exists, has been proven in the field, and there is both a clear need and expressed desire by domestic and international organizations for it. The safety of our troops and health support troops depend on sustainment of this network.

Thank you for the opportunity to submit this written testimony. I would be happy to answer any follow up questions the committee may have and we look forward to supporting efforts to thwart Ebola.