COMMITTEE ON
SCIENCE, SPACE, & TECHNOLOGY
Lamar Smith, Chairman

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Statement by Chairman Lamar Smith (R-Texas)

Surveying the Space Weather Landscape

Chairman Smith: Thank you, Chairman Biggs and Chairman Babin, for holding this hearing. While we are all familiar with terrestrial or Earth weather, what exactly space weather is, and why it deserves our attention, is much less widely understood.

Broadly speaking, space weather is the way the behavior of the sun and the nature of Earth's magnetic field and atmosphere interact. At a more detailed level, space weather is as complex of an issue as it is a consequential one.

At the center of space weather, as with terrestrial weather, are storms. The type and intensity of these storms can vary widely but all space weather storms do have one thing in common and that is they are affected by the sun.

Solar phenomena like solar flares send streams of charged particles toward Earth as solar wind. Once solar wind reaches Earth, it interacts in surprising and hugely consequential ways with our magnetic field.

The impact of these interactions varies and is dependent upon the intensity of the charge and concentration of particles in the solar wind.

However, disastrous events like GPS disruptions, satellites knocked out of orbit and permanent damage to large swaths of the electric grid are possible and, over time, likely.

As a general rule, the damage done by space weather events will be proportional to the amount of advanced technology exposed. In our modern, technology-laden world, a large storm could be incredibly costly in dollars and lives.

Geomagnetic induced currents that result from space weather can damage oil pipelines, railways, power grids and complex technology by causing extensive voltage surges. In the case of power grids, these currents have the potential to damage both transmission lines and transformers, which could potentially lead to the collapse of entire distribution networks.

Space weather is also dangerous to human life. Astronauts on the International Space Station and commercial aviation flights and their passengers could be exposed to significantly larger, and unsafe, amounts of radiation during space weather events.

Astronauts do have technologies in place to help protect them. Flights can be re-routed and grounded. But these quick, piecemeal fixes are not sustainable solutions to a potential major solar weather event.

Just as we currently forecast the active elements of terrestrial weather involving water, temperature and air, so too is there potential to do the same for space weather. In fact, efforts to model solar activity and forecast the active elements of space weather - the concentration of particles, electromagnetic energy and magnetic field impacts - are already underway at federal agencies and private entities.

The recent White House Office of Science and Technology Policy and the National Oceanic and Atmospheric Administration's request for information about space weather and ways commercial entities can help deserves our support. The efforts the private sector has been taking are promising and we should encourage them.

We are increasingly dependent on advanced technology. The potential for disruption to society, including the possible destruction of critical infrastructure by space weather events, is alarming. While we have made strides toward better modeling and prediction of solar phenomena as well as accurately forecasting space weather, there is still significant room for improvement.

I look forward to learning from our witnesses today and hearing their insights and perspectives on this topic. This committee has a bipartisan history of meeting the challenges and advancing U.S. leadership in space and I am hopeful space weather will be no exception.

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