

Charles Bolden, NASA Administrator
2013 Space Weather Enterprise Forum
NOAA Auditorium and Science Center
Silver Spring, MD

June 4, 2013

Thank you Michael [Bonadonna] for that gracious introduction and for the opportunity to join you and our partners across government, academia, and the research community for this important discussion about what we can do to mitigate the impacts of space weather. I also want to acknowledge the other presenters in this opening session: Chairman of the House Subcommittee on Space, Representative Steven Palazzo; Acting NOAA Administrator, Dr. Kathryn Sullivan; and Samuel Williamson, Federal Coordinator for Meteorology.

Before I begin, I want to join the President, the people of Oklahoma, and a grateful nation in expressing my appreciation for the work that Kathy Sullivan and her team at NOAA have done these past few weeks in response to the devastating outbreak of tornadoes that have affected so many communities throughout the Midwest. While we mourn all those who were swept away by the storms, we know that it could have been much worse and that NOAA's early warnings helped save lives. I also want to echo the President in offering my gratitude to the men and women of FEMA and the other first responders and volunteers who always run towards danger. Finally, I want to especially acknowledge the heroic efforts of the teachers in Moore, Oklahoma who put themselves in harm's way two weeks ago to save their students. Please join me in thanking them all for showing us the true humanitarian spirit of the United States of America.

This conference shines a spotlight on another naturally occurring phenomenon that can be just as punishing as a tornado – Space Weather.

As we all know, solar storms pose risks to humans in space and can cause disruption to satellite operations, communications, navigation, and electric power grids here on Earth. Given the growing importance of space to our Nation's economic well being and security, it is of increasing importance that NASA and its partner agencies continue to advance our Nation's capability to understand and predict space weather events.

Furthermore, space weather impacts can be seen throughout the solar system. Space weather forecasting is crucial to NASA's human and robotic exploration objectives. The Space Radiation Analysis Group at NASA's Johnson Space Center is responsible for ensuring that the radiation risks to astronauts are understood so that we can continue to ensure their safety.

Just last week, researchers announced the first data collected by the NASA Mars Science Laboratory Radiation Assessment Detector (RAD) during the mission's eight-month journey to Mars. Integrated aboard the *Curiosity* rover, the instrument is the first to measure the radiation environment inside a spacecraft protected by shielding while en route to Mars. The findings will aid design of future human missions by reducing uncertainty about how much shielding from radiation astronauts will need. For these and other reasons this forum and our efforts to study, monitor, and mitigate radiation exposure are so very important.

NASA is proud to work alongside many of you as a member of the National Space Weather Program, and our Heliophysics Division is engaged in a national research program to help us better understand the sun and its interactions with our planet and solar system.

NASA currently operates 18 missions studying the sun and the solar wind, which have produced a number of scientific discoveries over the last year alone. *Voyager* has taken us to the edge of our solar system; the twin Solar TERrestrial RELations Observatory (*STEREO*) spacecraft have allowed us to view space weather events throughout the solar system; the Solar Dynamics Observatory (SDO) is helping us understand the causes of solar variability and its impacts on Earth; and the recently launched Van Allen Probes have already made new discoveries within Earth's radiation belts. Furthermore, for the first time, we have complete coverage of the sun from all angles 24 hours a day, 7 days a week. We are now able to track the evolution of solar events from the solar interior to the surface of Earth, connecting the magnetized structure in the sun's corona to the detailed features of Earth-directed coronal mass ejections (CMEs), or solar flares, to the intricate anatomy of geomagnetic storms as they impact Earth two to three days later.

Several of these research satellites have become an essential part of our Nation's space weather prediction system. One example is the Advanced Composition Explorer (ACE) mission, which serves as an operational sentry for NOAA by providing early warning of incoming solar storms. However, ACE has been operating for 15 years and is well beyond its design life. NASA is refurbishing the Deep Space Climate Observatory (DSCOVR) on a reimbursable basis for NOAA. DSCOVR will be NOAA's first operational space weather mission. Planned for a FY2015 launch, DSCOVR will have instruments that will provide critical operational space weather measurements to NOAA. Additionally, our FY 2014 budget request supports initial operations of our newest mission, the Interface Region Imaging Spectrograph (IRIS), planned for launch in late June, as well as continued development of the Magnetospheric Multiscale (MMS) mission, which is planned for launch in 2015 to investigate how the sun's and Earth's magnetic fields connect and disconnect.

NASA continues to formulate the Solar Probe Plus (SPP) mission and develop its contribution to the European Space Agency's Solar Orbiter mission to study the sun from closer than ever before.

You will hear more about all of this later from the distinguished panelists here today. I just want to conclude by again, thanking all of you for this extraordinary public-private effort. I am also gratified that this issue is attracting more worldwide attention. Space Weather is a problem that crosses all borders and demands input from our international counterparts.

Next week, I will be addressing the 56th session of the United Nations Committee on the Peaceful Uses of Outer Space in Vienna) UNCOPUOS. This year, for the first time, the Committee recognized solar activity as a concern on par with orbital debris and close-approaching asteroids. As a result, space weather has been added as a permanent item on the Committee's agenda.

With the United Nations now on our team, we are assured of even greater global coordination in the effort to increase our understanding of space weather and its impact on Earth and throughout our solar system.

We have shown how, working as a team, we can save lives when hurricanes and tornados strike here on Earth. I am confident we can be just as effective working together to protect our people, our critical infrastructures, and our planet from the dangers of space weather.

Thank you.