

# Preparedness Alert

Colorado Division of Homeland Security and Emergency Management  
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**COLORADO**  
Division of Homeland Security  
& Emergency Management  
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**Office of Preparedness**  
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**Office of Emergency  
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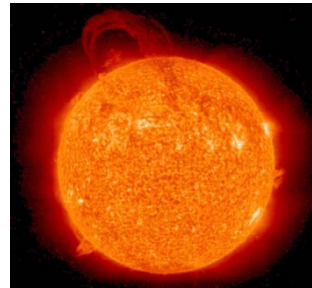
**Colorado Information  
Analysis Center (CIAC)**  
Capt. J.P. Burt, Director

**Mission**  
Provide leadership and  
support to Colorado  
communities to prevent,  
protect, mitigate, respond  
and recover from all-  
hazard events including  
acts of terrorism.

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## Solar Flares, Geomagnetic Storms Pose Risk

In an increasingly technology-dependent world, solar weather - such as geomagnetic storms and solar flares - has the potential to disrupt communication systems, the electric grid, transportation, ordinary devices such as kitchen appliances and more. Less intense storms may simply interrupt communications, but can also lead to power outages lasting a few hours. Stronger storms have the potential for creating longer-lasting, widespread power outages and other issues.



The sun during a solar storm – NASA photo

### Issues

- Both solar flares and geomagnetic storms can disrupt communication systems, navigation such as Global Positioning System (GPS), and the electric grid, as well as having a significant impact on interconnected systems.
- Loss of power, in particular, can have a significant impact on communities as the length of time the power is out increases. For example, in larger cities a power outage shuts down traffic lights causing congestion that may completely block all streets – and access for emergency equipment. In all areas, a power outage effectively shuts down gas stations and may other sources of fuel. Lack of power essentially brings much of daily life to a halt.
- The National Academy of Sciences notes that loss of power can also affect water supplies, banking and finance, and most other forms of critical infrastructure, including government services – which can include police and fire protection.

### Impacts

- Solar flares and geomagnetic storms strong enough to cause major disruptions for an extended period of time – days, weeks, or even longer – are rare. Issues with telephones, including cell phones, can be expected.



- The Earth's magnetic field will repel most of the radiation from even a large solar storm, so the potential for direct impacts on human health are minimized. However, the effects of a loss of power can disrupt home medical equipment, food storage and the ability to find needed supplies.
- Travel may be difficult or impossible due to traffic congestion or lack of fuel, and banking services, such as ATMs, may not work.

## Preparedness

- Build a family communication plan. Although solar weather can disrupt communications, it is possible some services will not be impacted or impacted less severely. A form to help you build a communication plan is available at <http://www.readycolorado.com/wp-content/uploads/2012/08/familycommunicationsfillable.pdf>.
- Designate a family meeting location and alternate location. Solar weather is unlikely to cause damage to your home, but you may not be home when a solar event occurs. Make sure each family member knows where to meet.
- Have an emergency kit for each family member, including food, three-day supply of water, toiletries and any special care items each person needs. More information about emergency kits can be found at <http://www.readycolorado.com/ready-central/build-a-kit/>.
- Have family conversations to discuss your emergency plans and how members can work together to keep everyone safe. Practice your plan several times each year.

## For more information

- National Academies Press, Severe Space Weather Events – Understanding Societal and Economic Impacts: A Workshop Report. [http://bit.ly/space\\_weather](http://bit.ly/space_weather)
- James A. Marusek, Solar Storm Threat Analysis. [http://bit.ly/solar\\_threats](http://bit.ly/solar_threats)
- National Weather Service Space Weather Prediction Center - [http://bit.ly/NWS\\_space](http://bit.ly/NWS_space)
- Live solar images and data - <http://sunspotwatch.com/>
- Solar Terrestrial Relations Observatory (STEREO) - [http://bit.ly/solar\\_stereo](http://bit.ly/solar_stereo)
- Animated explanation of solar flares: [http://bit.ly/solar\\_an](http://bit.ly/solar_an)
- General preparedness – [www.readycolorado.com](http://www.readycolorado.com)

## Solar storm fast facts

- The largest solar storm on record occurred in 1858. Telegraph operators noted glowing telegraph lines and the ability to transmit without battery power.
- The peak of the sun's 11-year activity cycle should occur in 2013, leading to increased solar activity.
- The wave of charged particles emitted from the sun during a solar storm is known as a coronal mass ejection or CME.
- One of the more benign effects of a solar storm is increased aurora activity. This allows the northern lights to be viewed in latitudes well south of typical visibility.