

RESEARCH NOTE**● Geomagnetic Storms**

On March 13, 1989, a storm hit Montreal, Quebec. But this wasn't an ordinary storm. This was a geomagnetic storm that caused an electrical blackout. About 6 million people went without electricity for 9 hours.

What Is a Geomagnetic Storm?

To understand a geomagnetic storm, you must first know a few things about the sun. By looking closely at the surface of the sun, scientists have discovered that it has cycles of very violent activity. Powerful eruptions called solar flares occur periodically, sending charged particles outward at almost the speed of light and with the energy of millions of hydrogen bombs. As particles explode away from the solar surface, they create a solar wind of charged particles that travels several million kilometers per hour through space between the sun and the Earth. A geomagnetic storm occurs when the solar wind sweeps across Earth's atmosphere, causing a variety of disturbances.

Grids and Pipelines

Geomagnetic storms happen frequently, especially in the north. As the people of Quebec found out in 1989, such storms can interfere with systems used to operate power grids. They can also cause heavy static in long-distance radio reception and can affect the orbit of satellites. Geomagnetic storms can even cause corrosion in the metal of petroleum pipelines. In fact, scientists are not sure that they know of all the systems and materials that are affected by geomagnetic storms.

Knowledge Is the First Line of Defense

Solar flares are not well understood and are difficult to predict. There may be nothing that can be done to stop geomagnetic storms, but understanding them better is the first step toward protecting valuable systems from an eruption's effects. Scientists prepared several satellites to study the sun's activity and solar flares in 2000 and 2001. By studying solar eruptions, scientists think they can predict a geomagnetic storm 50 to 70 hours in advance. This could give industries affected by these storms time to protect their systems.

Solar Sails for Solar Wind

Do research on solar flares and geomagnetic storms. Government agencies and universities have a number of programs, including satellites, to study and predict solar events. Create a model or a poster to explain something you learned from your research.