Mapping The Ionosphere

Solar storms often impact the Earth's upper atmosphere, the ionosphere. The region of free electrons and ionized atoms fluctuates with solar activity; under severe conditions, this activity has interrupted communications and electrical power over wide areas. These storms also cause error in basic Global Positioning System (GPS) receivers.

NOAA's National Geodetic Survey (NGS), in conjunction with other NOAA agencies, use GPS signals to measure ionosphere variations and have developed a technique to map daily changes in the ionosphere. GPS data from national continuously reference stations are used to compute daily Total Electron Count (TEC) maps for the area above each station. TEC contour maps are available three days after the data are collected, from October 19, 1997, to the present. An animated map image is available at http://www.ngs.noaa.gov/GRD/GPS/Projects/TEC/.

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The U.S. Department of Commerce
National Oceanic and Atmospheric Administration
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The National Geodetic Survey (NGS) defines and manages the National Spatial Reference System, which determines position, height, distance, gravity, and shoreline throughout the United States. Since 1807, NGS and its predecessor agencies have led the world in precise positioning and developed emerging technologies for the public. NGS provides its expertise and a wealth of free information, including direct access to its data base on the World Wide Web at: **www.ngs.noaa.gov**.