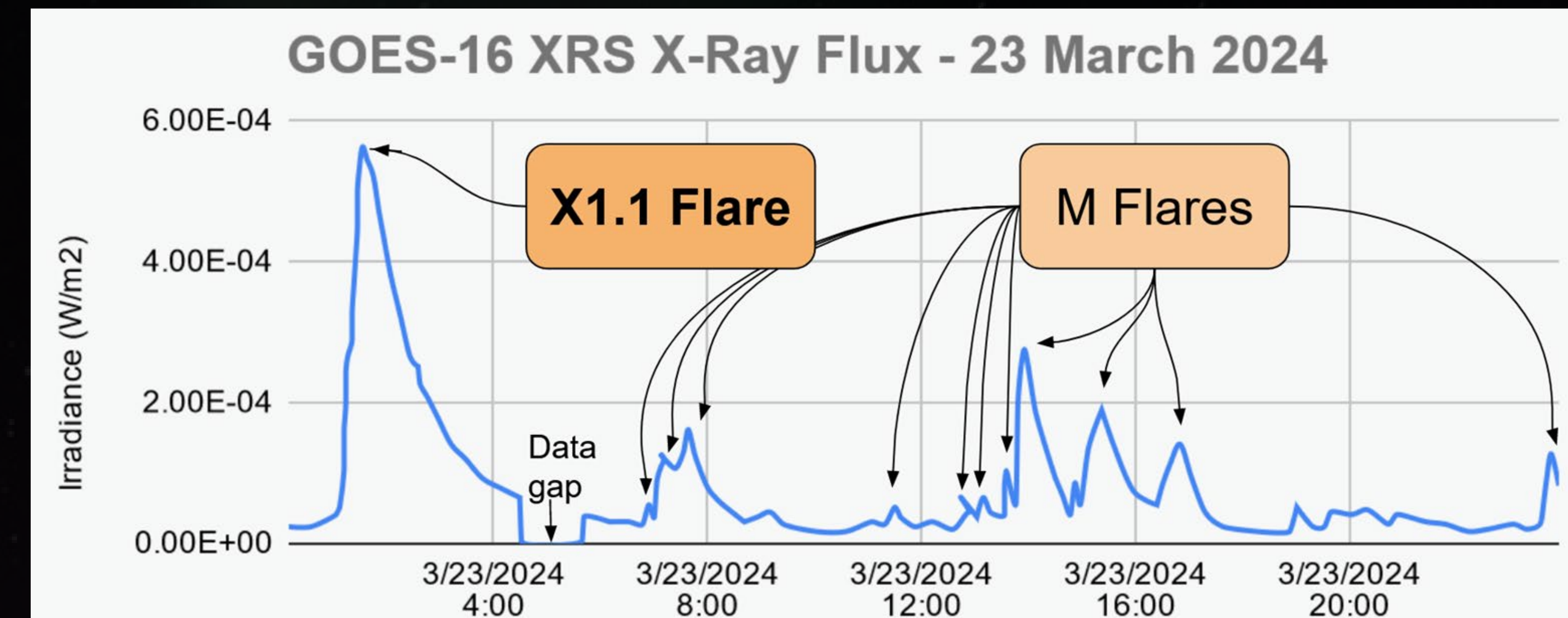
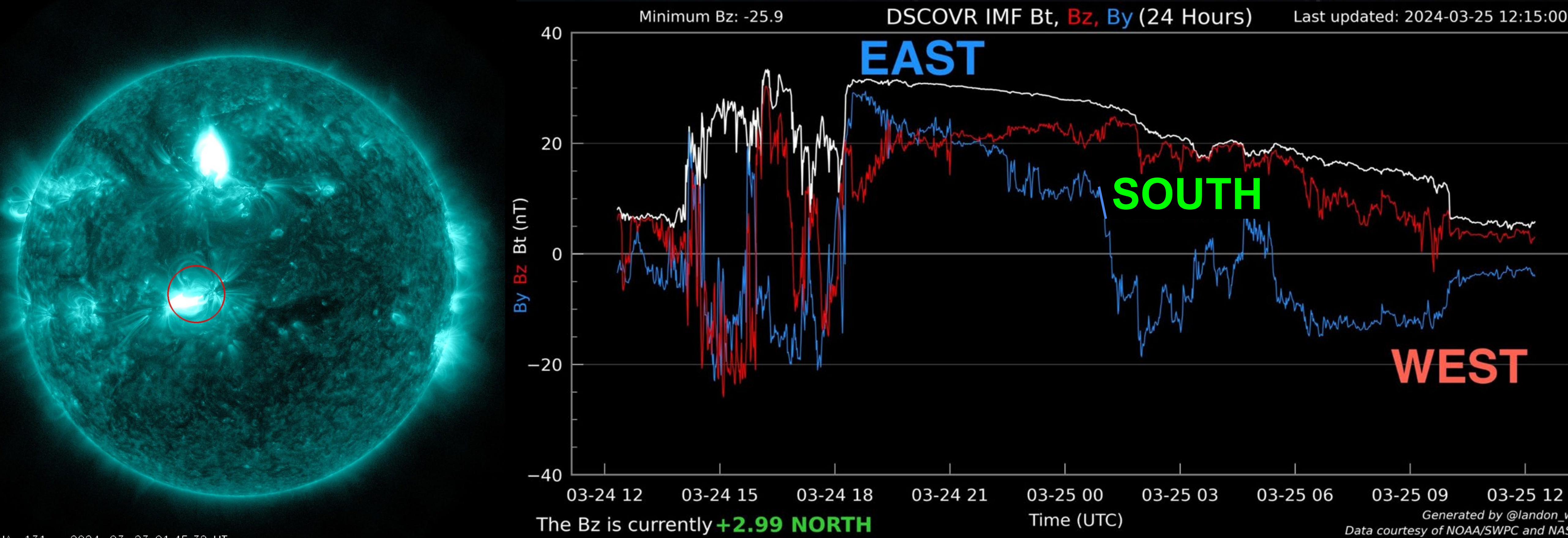


23 March 2024 Halo CME Severe (G4) Geomagnetic Storm - Did You Feel It?

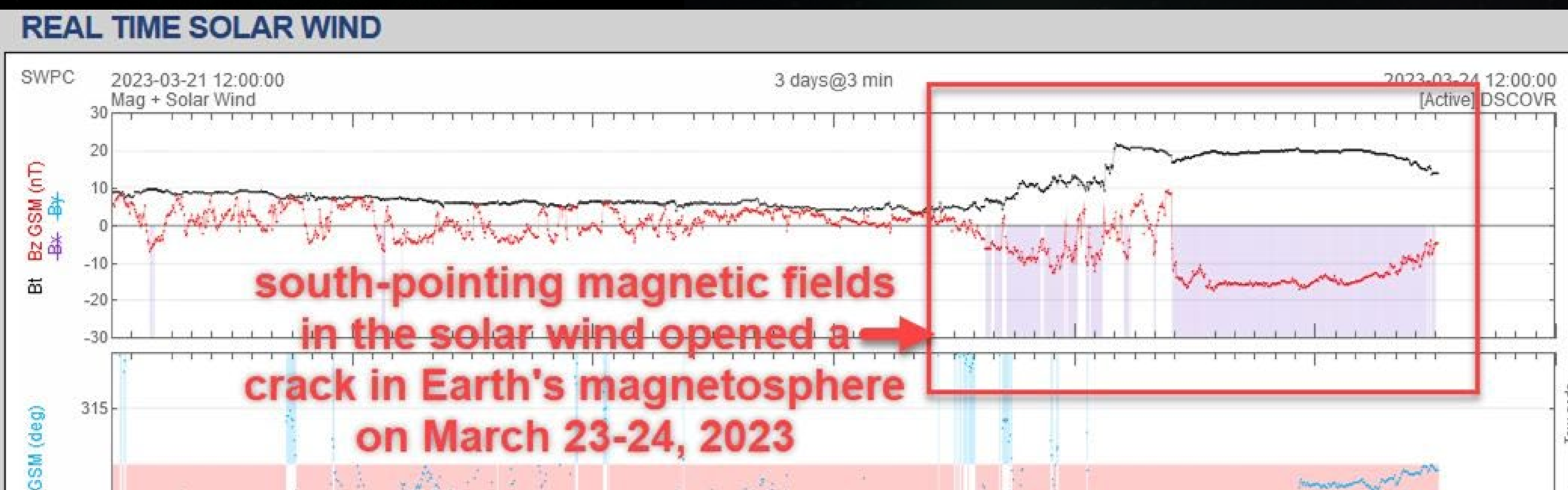
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The sun launched a powerful coronal mass ejection toward the Earth on 23 March 2024. This caused a severe (category G4, the maximum is G5) geomagnetic storm that spanned from 24 to 25 March. The NOAA National Weather Service issued a warning of "increased possibility of anomalies or effects to satellite operations". Aurora chasers geared up for increased activity. Magnetic observatories saw large (3000+ nT) variations, particularly in the horizontal component of the Earth's magnetic field, and particularly at high latitudes. A NOAA CrowdMag volunteer recorded awesome magnetic variations using a cell phone in northern Alaska. Large geomagnetic variations can also cause stress for animals, such as birds and fish, that sense the magnetic field for navigation. Studies have shown that even some humans experience measurable physiological effects from magnetic field disturbances.

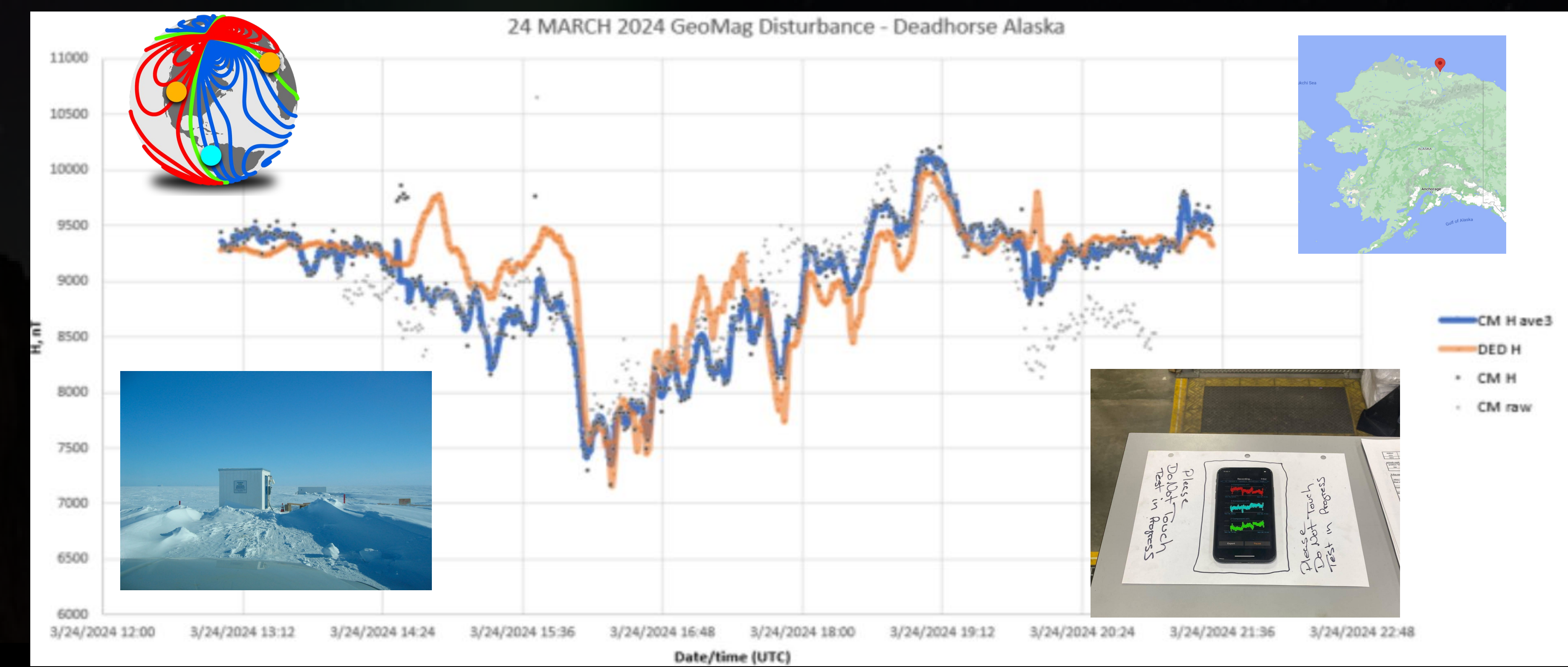


The GOES-16 Solar X-Ray Sensor, which is part of the satellite's EXIS instrument, measures X-ray irradiance (i.e. brightness). This plot shows how the flux changes over the course of March 23rd. Sharp peaks correspond to solar flares of different classes. The data gap is caused by the Earth passing between the satellite and the sun.



Auroras were visible to the naked eye in Central Virginia (bottom left), Missouri (middle), and were seen as far south as New Mexico.

The phenomenon, STEVE (Strong Thermal Emission Velocity Enhancement) is caused by hot (3000°C) ribbons of gas flowing in Earth's magnetosphere at speeds exceeding 6 km/s (13,000 mph). They were seen in Montana (right), South Dakota, Idaho, Washington State, and Scotland.



Cooperative Institute for Research in Environmental Sciences
UNIVERSITY OF COLORADO BOULDER and NOAA

