

Supporting Space Weather with the Geospace Dynamics Constellation

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ABSTRACT

The Geospace Dynamics Constellation (GDC) mission, planned to launch at the end of the decade, is a six-satellite constellation that will fly through the ionosphere and thermosphere at around 400 km. While GDC is a science mission, its comprehensive instrumentation will not only contribute to our understanding of space weather phenomena in the ionosphere-thermosphere system, but will also provide valuable, space weather-relevant data. Data from GDC will be made available at low latency via real-time space weather data stream. We are working with operational partners to identify space weather data products and coordinate reception of the space weather beacon data. Alongside preparations for real-time GDC data streams, we are working to identify current model capabilities and needs, to ensure that space weather models that can make use of GDC measurements are moving along the Research-to-Operations pipeline. Before GDC launch, Observing System Simulation Experiments (OSSEs) carried out with synthetic GDC data can be used to demonstrate the capabilities of models and to predict the impact of GDC data. Following launch, Observing System Experiments (OSEs) will demonstrate the impact of GDC space weather data. In preparation for GDC, the ITM space weather community should establish baseline metrics for space weather parameters of scientific and operational interest. These metrics, tracked over time before and after the launch of GDC, will allow us to track advancements in forecasting, nowcasting, and hindcasting of the ITM system and to trace the impact of scientific progress from space weather research into operations. By demonstrating the impact of real-time GDC data, specific data needs can be identified and prioritized for long term investment on future observing systems.