Using Science Data and Models for Space Weather Forecasting – Challenges and Opportunities

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Space research, and, consequently, space weather forecasting are immature disciplines. Scientific knowledge is accumulated frequently, which changes our understanding or how solar eruptions occur, and of how they impact targets near or on the Earth, or targets throughout the heliosphere. Along with continuous progress in understanding, space research and forecasting models are advancing rapidly in capability, often providing substantially increases in space weather value over time scales of less than a year. Furthermore, the majority of space environment information available today is, particularly in the solar and heliospheric domains, derived from research missions. An optimal forecasting environment needs to be flexible enough to benefit from this rapid development, and flexible enough to adapt to evolving data sources, many of which may also stem from non-US entities. This presentation will analyze the experiences obtained by developing and operating both a forecasting service for NASA, and an experimental forecasting system for Geomagnetically Induced Currents.