

# WSF-M



## Weather System Follow-On-Microwave

WSF-M is the Department of the Defense's (DoD) next-generation operational environmental satellite system, delivering the accurate, actionable environmental intelligence warfighters need to better prepare and conduct their missions.



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## Overview

WSF-M will improve weather forecasting over maritime regions by taking global measurements of the atmosphere and ocean surface and filling an important space weather data gap. The mission is designed to specifically address three high-priority space-based environmental monitoring (SBEM) requirements: ocean surface vector winds; tropical cyclone intensity; and LEO energetic charged particle characterization, a space weather gap. The design characteristics of the WSF-M microwave sensor, which includes a large 1.8 meter antenna, will also enable mitigation of three more SBEM gaps, including sea ice characterization, soil moisture and snow depth.

The WSF-M primary payload is a passive microwave radiometer, a sensor with a long history of making critical measurements of the physical properties of the atmosphere, ocean and land surface and used by multiple agencies, including the U.S. Air Force, U.S. Navy and NOAA. WSF-M will build off the success of previous DoD passive microwave sensors, including the Defense Meteorological Satellite Program's Special Sensor Microwave Imager/Sounder and the Navy Research Laboratory's WindSat sensors.

## Our Role

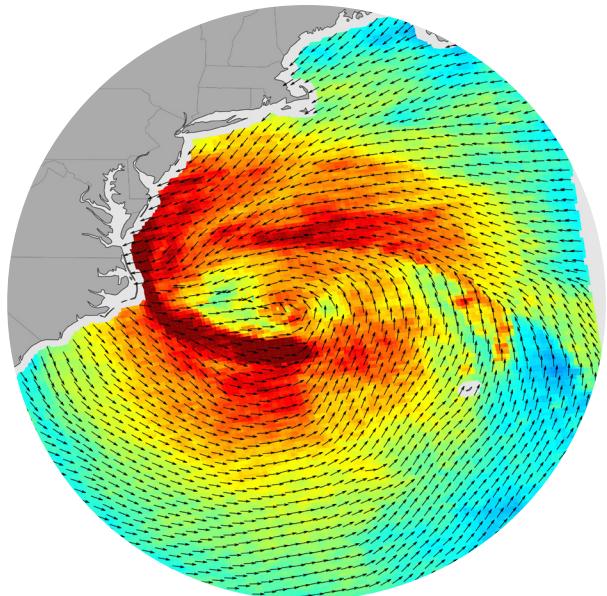
We are the prime contractor for the WSF-M mission, responsible for developing and integrating the entire microwave system, including the instrument, spacecraft and ground system software.

The new environmental system leverages the Ball-built Global Precipitation Measurement (GPM) Microwave Imager (GMI) sensor, the on-orbit reference standard for calibrating precipitation measurements in NASA's GPM constellation. The WSF-M bus will be based on the Ball Configurable Platform, a proven, agile spacecraft with 50 years of on-orbit operations for affordable remote sensing applications.

Ball is an industry leader in the design and development of advanced SBEM systems. WSF-M extends our legacy of providing precise measurements from space to enable more accurate environmental forecasting. Additional examples of our SBEM experience include spacecraft and instruments for NASA/NOAA's Suomi National Polar-orbiting Partnership (Suomi-NPP) and Joint Polar Satellite System (JPSS)-1/NOAA-20 missions; GMI; five Ion Velocity Meter space weather instruments flying on the COSMIC-2 constellation; and the spacecraft currently in production for the NASA/NOAA Space Weather Follow-On (SWFO) mission.

## Advantages

- The Ball Configurable Platform is a stable, agile, spacecraft designed specifically for long-lived, remote-sensing missions like WSF-M
- Ball has successfully delivered 10 spacecraft similar to WSF-M
- WSF-M will utilize proven legacy microwave sensor design with documented on-orbit performance
- WSF-M will reuse RSS operational ocean surface vector wind algorithms developed for the U.S. Navy; Atmospheric and Environmental Research (AER)-adapted operational algorithms for other required Environmental Data Records (EDR)



Data from the Ball-built GMI meets all performance requirements and is the calibration standard for the GPM constellation.



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