EVS-3 Investigation of Microphysics and Precipitation for Atlantic Coast-Threatening Snowstorms (IMPACTS)

Start Date:	**January 1, 2019**
Confirmation:	**October 7, 2019 (scheduled)**
End Date:	**December 31, 2023**
Airborne Platform:	**P-3 (WFF) and ER-2 (AFRC)**
Data Center:	**not assigned**
Principal Investigator:	**Lynn McMurdie (U. Washington)**
Investigation Manager:	**Vidal Salazar (ESPO/ARC)**
Deputy PI for data:	**Gerald Heymsfield (GSFC)**
Deputy PIs for science:	**John Yorks (GSFC)**
Science Advisor:	**Scott Braun (GSFC)**
Program Executive:	**Bruce Tagg (HQ)**
Program Scientist:	**Tsengdar Lee (HQ)**
ESSP Mission Manager:	**Jennifer Olson (LaRC)**

Project Cost Cap: **$30M over five years (2015-2020)**

Summary: Winter snowstorms are frequent on the eastern seaboard, where a large percentage of the US population lives, and cause major disruptions to transportation, commerce, and public safety. Snowfall within these storms is frequently organized in banded structures that are poorly understood by scientists and poorly predicted by current numerical models. IMPACTS will provide observations critical to understanding the mechanisms of snow band formation, organization, and evolution. The objectives are to characterize spatial and temporal scales and structures of snow bands in the NE US, to understand the dynamical, thermodynamical, and microphysical processes producing these structures, and to apply this understanding to improve snowfall remote sensing interpretation and modeling and predictive capabilities.

Implementation: IMPACTS will fly a complementary suite of remote sensing and *in-situ* instruments for three 6-week wintertime deployments on the ER-2 and P-3 aircraft. The airborne instrument suite provides a synergistic range of measurements for snow process studies, combining advanced radar, lidar, and microwave radiometer remote sensing instruments on the ER-2 with state-of-the-art microphysics probes and dropsonde capabilities on the P-3. By flying the two aircraft in a vertically stacked coordinated pattern, with flight legs orthogonal to the snowband orientation, the instrument suite provides collocated dynamical and microphysical measurements that advance our understanding of processes in winter storms.

NASA Earth Science Relevance: IMPACTS addresses the NASA Earth Science Enterprise science goal to study Earth to advance scientific understanding and meet societal needs, and the NASA Weather Focus Area's research objective to "enable improved predictive capability for weather and extreme weather events." IMPACTS is also relevant to the Global Precipitation Measurement (GPM) and CloudSat missions, and the National Academies recommendation for a designated program focused on clouds, convection, and precipitation.