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NOAA UAS Aerosol Payload Demonstrated in Arctic Environment

Svalbard, Norway Manta UAS Testing Moves Technology Readiness Level (TRL) to 8

NOAA Manta UAS were successfully flown and achieved their scientific goals while flying 17 mission hours from Ny-Ålesund, Svalbard, Norway during the Spring 2015. During the recent Post Mission Review, Dr. Tim Bates (University of Washington and NOAA/PMEL), described the international coordination through the Coordinated Investigation of Climate-Cryosphere Interactions (CICCI-3) initiative, "The central goal of the initiative was to improve the understanding of processes controlling the distribution of black carbon (BC) in the Arctic atmosphere, the deposition of BC to snow and ice surfaces, and the resulting climate impacts. The NOAA UAS flew several different payloads to measure the spatial and temporal variability of aerosols and ocean and ice conditions in and near the marginal ice zone."

Flight operations were coordinated with Northern Research Institute (NORUT) which were in close communication with the Norwegian Civil Aviation Authority (CAA) to obtain all the necessary permits for ICCI to fly both the Norwegian and US UASs. In the field, NORUT communicated with air traffic control, the station safety officer, and the local government (Governor of Svalbard) during operations. The US UAS part of CICCI-3 was funded by the Gordon and Betty Moore Foundation and the NOAA UAS program and were able to accomplish:

Mission Objectives:

- NOAA - Transition the NOAA UAS Aerosol Payload to Technology Readiness Level (TRL) 8 (System demonstration in an operational environment)
- Moore Foundation – Transition the Lamont-Doherty Payloads to Technology Readiness Level (TRL) 8 (System demonstration in an operational environment)

Science Objectives:

- Measure the vertical distribution of BC, chemical tracer species and aerosol properties in the Svalbard region;
- Determine the concentration of BC in snow, assess deposition processes, and the processing of BC in the snow layer;
- Determine snow properties and measured surface albedo to investigate the effect of BC deposition on the albedo of surface snow and ice;
- Use chemical tracer species and FLEXPART modeling to identify the sources and transport pathways of BC to the Arctic

Is this is an issue of potential concern?**This item has high visibility****Geographic Location (Relevant region, city location)** Svalbard, Norway**Partnering offices** OAR- UAS Program, PMEL, ESRL, CSD, OMAO-AOC**Contact's email address** john.j.coffey@noaa.gov**Contact's phone number** (904) 923-1709