

## **UAV Observations of the Atmosphere over the Terra Nova Bay polynya: September 2009 and September 2012**

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In September 2009 and September 2012 Aerosonde unmanned aerial vehicles (UAVs) were used to make measurements of the Antarctic atmosphere over the Terra Nova Bay polynya in the western Ross Sea. During these flights temperatures as low as -35 C and winds up to 40 m/s were observed. Observations from the UAVs allowed us to map the horizontal and vertical extent of the strong downslope winds draining from the Antarctic continent, observe the downwind evolution of this airmass as it passed over the polynya, estimate the amount of heat and moisture transferred from the ocean to the atmosphere, and the amount of momentum transferred from the atmosphere to the ocean. Aerial photographs taken during the flights show a wide variety of ocean and sea ice states in Terra Nova Bay. These flights are the first in-situ wintertime measurements of the atmosphere over the Terra Nova Bay polynya. To our knowledge these were the longest duration UAV flights in the Antarctic. Some of the challenges faced in operating under the harsh Antarctic conditions will be discussed.