

Working with UAS in challenging environments: central Australian deserts, Armenian high mountains and Antarctic icebreakers, some lessons learnt.

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Keywords: Deserts, Mountains, Sea Ice, UAV

Abstract:

Advances off-the-shelf UAS technology in the past few years has significantly simplified the effective capture of aerial imagery. Ready to fly UAS packaged with flight planning and processing software require little training to operate, this has led to a large uptake globally. However, when operating these UAS in non-typical environments there are challenges that require consideration. This paper explores three case studies in locations that test the UAS platforms to their limits.

Recent projects by Australian UAV Chief Operator James Rennie include high altitude survey work with a Sensefly eBee in the southern Armenian mountains near Iran, a program of over 130 eBee flights in far western NSW desert, and assisting the Australian Antarctic Division navigate sea ice in the Aurora Australis supply ship.

In August 2014 Australian UAV were contracted to map tailings dams in southern Armenia. One of the dams was located in the high mountains over 3500m above sea level. The steepness of the terrain, altitude and hot summer temperatures affected the performance of the UAV and creating significant challenges that had to be overcome.

Australian UAV has twice now completed a perimeter survey of Lake Victoria in far Western NSW. The survey over a period of a week includes over 130 eBee UAV flights in hot temperatures, fending off eagles while landing on fine sand. With over 40,000 photos taken in a week project planning and data management are the key to success.

The most recent challenge has been to trial the use of multi-rotor UAVs for the Australian Antarctic Division (AAD) on the Aurora Australis icebreaker off the coast of Antarctica. High winds, a non-calibrated compass, snow and a moving take-off and landing area presented a unique set of challenges to overcome. As a side project the Sensefly eBee was also put to work mapping the contemporary and abandoned Stations of Casey and Wilkes. The successful projects have identified many opportunities for the use of UAS within the operations of the AAD.



Figure 1. Australian Antarctic Division supply ship Aurora Australis.

These unique projects provide insight into the flexibility of the UAV platforms while also identifying potential limitations.

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