

Antarctic Peninsula Automatic Weather Station Network

2017-18 Field Season Review

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1. Overview

The British Antarctic Survey (BAS) is responsible for a network of automatic weather stations (AWS) located on the Antarctic Peninsula and in the Halley region. BAS also service two further AWS on the Larsen C ice shelf in collaboration with the University of Utrecht.

All BAS AWS sites measure wind speed, wind direction, temperature, pressure and relative humidity. Data are logged to a Campbell CR1000 data logger and ten minute averaged data are saved to a data card. Ten minute averaged data are transmitted via SBD Iridium every three hours and relayed as SYNOPS on the GTS. Once a week the complete data set is sent via Iridium. The AWS are powered by two 100Ah 12V lead acid batteries, charged by solar panel. Assuming normal service, these stations need only be visited to raise the instruments, logger box and batteries above snow accumulation and to retrieve and replace data cards. Visits usually take place every one or two years depending on weather conditions and aircraft operational commitments.

2. 2017-18 season

This season all sites, except Dismal Island and Koni Steffen's AWS were visited for data retrieval and instrument raising. The AWS at Dismal Island belongs to the University of Wisconsin. The AWS was visited from the HMS Protector via helicopter in February 2017 and this was the first time the site had been visited since 2009. The system was completely

replaced at this visit as the AWS in its previous state had ceased to work. The site is currently functioning, however it does suffer from occasional data drop out and intermittent temperature readings. There are no plans to visit this site this coming season. Replacement loggers with new internal batteries, upgraded operating systems and new programs were installed at all BAS sites.

At Site 8 the whole system for Limbert AWS, including instruments, logger box and power system was replaced. Recurrent data dropouts and power failures have plagued this AWS so to prevent further drawn-out trial and error procedures a complete and fully tested system was installed.



Figure 1. A typical BAS AWS.

University of Utrecht

The two remaining Intelligent Weather Stations (iWS) located on the Larsen C ice shelf continue to work well after finishing their two-year trial running alongside their older AWS

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versions. These iWS were developed by the University of Utrecht. The old style AWS that were co-habiting with the new iWS were all removed from the sites during the 2016/17 season leaving the iWS in place. The iWS is a small unit (18x22x12cm) which comprises a power system (solar panels and lithium batteries), logger and all sensors, except a propane and radiation sensor which are plugged into the unit and are mounted on the same rig. Data are transmitted via ARGOS. The units, propane and radiation sensor are replaced annually, when operational commitments allow, with a normal service time of less than an hour.



Figure 2. A University of Utrecht iWS on the Larsen C ice shelf.

3. Issues

This season the logger box at Fossil Bluff was found with condensation in it. During the past few summer seasons the mild temperatures at Fossil Bluff have caused a lot of melt water to form in the vicinity of the AWS. This could be a cause for increased condensation found in the logger box. Desiccant bags placed inside the logger box may be one method that can be adopted to help combat this problem.

The iWS units have a very delicate thermocouple sensor which protrudes out from the unit and faces down into the outside environment. Due to its fragility, the sensor that has battled the elements all year is frequently found to be damaged on arrival at the site. An experimental trial has been implemented to install the sensor facing up rather than down to see if this has any effect on damage limitation.

4. Intentions for 2018-19 season

This coming field season, operations will be carried out from both Rothera and Halley as usual to enable the best possible chance to visit and service all of the AWS.