

# Ten Years of Exploration with AWI's Research Aircraft Polar 5



On 1 October 2017, the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI) research aircraft Polar 5 had been in service for precisely ten years. In that time, the Basler BT-67 has flown more than 1.3 million kilometres to fulfil essential scientific and logistical duties. In the course of 48 measuring campaigns, predominantly for atmospheric research and geophysics

purposes, the aircraft has landed on both the Arctic sea ice near the North Pole, and at the South Pole.

Polar 5 is tailor-made for polar research: in the span of eleven months, the 65-year-old plane was essentially rebuilt from scratch. The Basler BT-67 is based on a modified Douglas DC-3 (which became famous as "raisin bombers"). The rebuild also provided the perfect opportunity to install the special-purpose equipment needed for survey flights. As a result, Polar 5 can lower the ice-thickness-measuring device EM-Bird and tow it through the atmosphere, while a special port in the hull allows probes to deploy sondes in flight. Thanks to her combination skid-and-wheel landing gear system, the plane can take off and land in even the most remote regions.

## Antarctic Missions

Upon being commissioned, Polar 5 – supported by 8.1 million Euros of funding from Germany's Federal Ministry of Education and Research (BMBF) – embarked on her maiden flight to the Antarctic. She first landed on Antarctica on 9 November 2007 and reached the Neumayer Station on 15 November. In the meantime, the plane has flown 14 scientific recording campaigns in six Antarctic summers – not to mention her passenger and logistics flights in the context of the international DROMLAN network.

Polar 5 also makes flights to the Arctic, and brings researchers to the Greenlandic glacier, where they extract ice cores and gather data on atmospheric aerosols and trace gases, as well as the distribution of sea-ice thickness, at regular intervals.

Since beginning service, Polar 5 has travelled to Antarctica six times and yearly to the Arctic, where it has contributed to 34 research projects. All told, she has completed 48 campaigns in both polar regions and flown more than 1.3 million kilometres – the equivalent to 32 trips around the Equator. For nearly six years now, she has also been supported by her sister ship Polar 6, which began service on 28 October 2011. AWI can now use both planes simultaneously, and can collect data on the same cloud from above and within at the same time. With two essentially identical planes, it's also easy to transfer measuring systems from one to the other as needed.

The Alfred Wegener Institute has operated research aeroplanes since 1983. Before Polar 5's day, the planes were Dorniers, most recently two Do228-101 models. "When equipped with the same instruments, the Basler offers us two more hours in the air than the Dornier," explains Daniel Steinhage. That means e.g. geophysical cartography flights can be extended much closer to the North and South Poles. In addition, the current aircraft offers substantially more room for survey equipment and passengers alike. As a result, many more working groups can participate in campaigns, and it is possible to collaborate with several national and international partners.

Polar 5 (registry C-GAWI) is currently at Lake Central Air Services in Muskoka, Canada, where she's being prepared to receive new measuring instruments. Once the new gear is in place, pilots and engineers from the Canadian company Ken Borek Air Ltd. will fly the craft back to Bremen Airport, Germany, tentatively on 21 November. Once Polar 5 is back home, AWI engineers and scientists will install and test new sensors. In March 2018 she'll leave for northern Greenland, where PAMARCMIP, her next major polar campaign, awaits.