Old photos shed light on the Antarctic

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Aerial photos from the 1940s and 1950s are being used to probe the climate history of the Antarctic Peninsula.

Researchers from Newcastle University, the British Antarctic Survey (BAS) and University of Gloucestershire, are comparing the images with newly acquired data sets to assess the changes that have occurred in some of the region's 400-plus glaciers.

The Antarctic Peninsula has undergone dramatic changes over recent decades due to global climate change and getting an accurate picture of change in volume and mass of the glaciers is difficult. Satellites are used to track such trends today but their records span only a relatively short timeframe.

Instead, the team are comparing the old photographs with modern information. Using novel techniques that are able to precisely position the pictures, the information is carefully aligned in order to make sure any comparisons are accurate and reliable.

Dr Pauline Miller, based in the School of Civil Engineering and Geosciences at Newcastle University, explains: "The archive of aerial photos goes back to the 1940s and represents an extraordinary account of the pioneering days of polar exploration.

"The men who ventured forth in their planes to capture pictures of the peninsula's rugged ice-scape took huge risks, with none of the back-up that modern expeditions can count on.

"They had no idea what they were flying into because no-one had ever been there before. The 1940s were just about flying to see what they could find, but by the 1950s it was much more systematic - for topographic mapping purposes. It was all about staking a claim in Antarctica when nations were becoming more competitive.

"That these old images still have scientific value in the 21st Century is down to novel techniques that are able to precisely position the pictures using newly created accurate, modern-day elevation models of the peninsula."

The study, funded by the Natural Environment Research Council (NERC), was presented this week at the American Geophysical Union Fall Meeting in San Francisco. Leading the talks were Dr Miller and Dr Lucy Clarke from the University of Gloucestershire

Speaking to the BBC, Dr Clarke said: "We want to use these pictures to work out volume and mass-balance changes in the glaciers through time.

"There are tens of thousands of these historical images, held by the British Antarctic Survey and the US Geological Survey.

"So, they've long been around, but it's only now that we've had the capability to extract the 3D data from them."

The team is using the latest optical satellite data to do this, as well as modern aerial photos acquired by BAS planes equipped with GPS.

Fundamental to these techniques is finding visual cues in the ice-scape that allow historical and current information to be married up.

"These visual cues have got to have some kind of rock; white areas of snow are no good to us because obviously they can change and they're

not easy to identify. We need stable areas like mountain peaks," adds Dr Clarke.

Provided by Newcastle University