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INDICATOR SPECIES POPULATION MONITORING IN ANTARCTICA WITH UAV

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Abstract. A program to monitor bird and pinniped species in the vicinity of Arctowski Station, King George Island, South Shetlands, Antarctica, has been conducted over the past 38 years. Annual monitoring of these indicator species includes estimations of breeding population sizes of three *Pygoscelis* penguin species: Adélie, gentoo and chinstrap. Six penguin colonies situated on the western shores of two bays: Admiralty and King George are investigated.

To study changes in penguin populations Unmanned Aerial Vehicles were used for the first time in the 2014/15 austral summer season. During photogrammetric flights the high-resolution images of eight penguin breeding colonies were taken. Obtained high resolution images were used for estimation of breeding population size and compared with the results of measurements taken at the same time from the ground. During this Antarctic expedition eight successful photogrammetry missions (total distance 1500 km) were performed. Images were taken with digital SLR Canon 700D, Nikon D5300, Nikon D5100 with a 35mm objective lens. Flights altitude at 350 – 400 AGL, allowed images to be taken with a resolution GSD (ground sample distance) less than 5 cm. The Image J software analysis method was tested to provide automatic population estimates from obtained images. The use of UAV for monitoring of indicator species, enabled data acquisition from areas inaccessible by ground methods.

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