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SPACE BASED PRE-OPERATIONAL SERVICES ON FLIGHT SAFETY

Abstract

Birds inhabit every continent on Earth. Every year 2-5 billion birds migrate from European breeding grounds to winter grounds in Africa. Unfortunately, birds can cause damage by colliding with aircraft: bird strikes are a serious threat for civil and military aviation, in fact depending on the specific circumstances such as the speed of the aircraft, the point of impact, the mass of the bird, the number of birds and the type of aircraft, bird strikes can result in devastating accidents. The annual costs of bird strikes due to damage and delays for the civilian aviation are estimated to be between 1 and 2 billion Euros.

Understanding bird movement is no easy task, and today simple techniques are used to track bird movements and understand the relationship between patterns in space and time and the environment; these sources of data are collected sporadically, at a limited number of locations or for a small number of species, and therefore, can rarely be used to solve problems at an international scale. But bird migration is not a local phenomenon; thus information about bird movements and bird behaviour on a global scale is fundamental for understanding bird migration and to model their behaviour. The simultaneous use of space and ground systems can therefore provide valuable information services in support of flight safety service domain.

In this context, ESA's IAP programme started in 2007 the FlySafe initiative: FlySafe is an on-going co-funded project in partnership with Dutch and Belgium Air Forces, industry, and research institutes, which aims to establish a bird-warning system to improve flight safety in northwest Europe. FlySafe combines space-based satellite systems, such as Earth Observation, Telecommunication, and Navigation tools, with non-space assets to develop migration prediction models and provide these as automated services to the partner Air Forces. This paper will present the concept of FlySafe pre-operational services that have been implemented in support of Dutch and Belgian Air Force operations for the geographic area of Benelux.