Bird flock tracking by weather radars

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ENRAM, European Network for Radar surveillance of Animal Movements, has discussed if flocks of big birds could be tracked using the available network of weather radars (OPERA in particular). We take a look on this issue utilizing the three dual-polarization C-band weather radar systems close to each other in southern Finland. Kumpula radar (KUM) is operated by the University of Helsinki, Vantaa radar (VAN) by the Finnish Meteorological Institute, and Kerava radar (KER) by Vaisala Ltd. KUM is a Vaisala WRK200, VAN and KER Vaisala WRM200 systems. The distances between the radars are 22, 19 and 9 km.

If we only think about the detection of the targets, tracking birds is not a problem by radars having the basic characteristic of weather radars. Operational radars map precipitation areas, and as a standard provide a three-dimensional view of echoes from precipitation. Unwanted echoes, including the birds and other single volume targets, may be filtered out in the data processing. In any case the use of many elevation angles means lower frequency scanning of any particular elevation angle. This makes tracking of individual targets challenging if not impossible.

More accurate analysis of surface precipitation and hazardous weather phenomena may already cause changes to the manner weather radars are operated, because of the need to have rapid updates of the situation close to the ground. This development should also help bird tracking using the weather radar data.

We shall present case studies of well documented episodes of large flocks observed by bird watchers at the surface. We comment the observations and results found in the simultaneous use of three dual-polarization weather radar systems, very close to each other but differing in measurement practices.