Use of Sentinel 1 and 2 data to assess crop area in Poland

In recent years, the Copernicus program enabled the free access to vast inventories of high resolution data. The satellites Sentinel 1 and 2 (S1 & S2) provide the optical and radar data each 4-5 days with the 10 – 20 m spatial resolution throughout the whole globe. Availability of such massive data source strengthens queries to reduce respondent burden and obtaining statistics faster and on the lower aggregation level. Since the beginning of the Sentinel mission, Statistics Poland started thorough work on crop area estimation using satellite data. Images in time series were processed and classified according to crop areas. In the pilot survey, several major crops were included such as cereals, rape, potato. The crop recognition method based on use of machine learning (the support vector machine - SVM). The satellite data classification was assisted by *in situ* data collection and administrative data (The Land Parcel Identification System). The whole process of crop area estimation included several steps such as satellite data acquisition, preprocessing (segmentation, delimitation of objects with uniform areas), classification and validation, generalization for territorial units. The *in situ* information was used as a training sample in the classification and validation stage for SVM, while the administrative data served for preprocessing segmentation. The S1 & S2 data supported each other, where S2 has the ancillary role in the segmentation. The obtained accuracy of crop recognition appeared to be high reaching 96%. The pilot survey was carried out by the Agriculture Department of Statistics Poland in cooperation with the Space Research Centre (CBK PAN) in the frame of annual projects funded by Statistics Poland.