

Abstract.

The paper presents an assessment of the quality of data from meteorological measurements made with low-cost sensors at amateur weather stations and the possibility of their inclusion in the National Hydrological and Meteorological Network (PSHM) of the Institute of Meteorology and Water Management - National Research Institute (IMGW-PIB).

The paper analyzes the types of amateur meteorological stations, the types of measurements made with these instruments and some measurement data distribution channels. Various networks of amateur weather stations were also characterized and a quantitative assessment of stations in individual networks associating amateur observers was made.

Measurements and comparative analyzes carried out at the testing ground and synoptic station of IMGW-PIB in Katowice-Muchowiec, as well as the verification and evaluation of extreme events on the example of high-intensity rainfall, in which verified data from amateur station networks were used, proved that they can become an excellent source of new information about the past and present state of the atmosphere.

Citizen science is a new dimension in building a civil society. It consists in collecting observations by project participants who, using the Internet and an intermediary scientific institution, create a publicly available database. This is how the concept of obtaining meteorological data from observers - volunteers performing their observations and measurements was born. The network of measuring stations of meteorological services, e.g. IMGW-PIB, has a relatively low density in relation to the area of the entire country. In order to improve the quality of information on the occurrence of extreme events, which are usually small-scale, it is necessary to thicken the observation network and enable volunteers to report events using the Internet. The conducted research shows that dynamic supplementation of IMGW-PIB measurement data with volunteer stations will not only increase the possibility of monitoring extreme phenomena, but also improve the quality of numerical weather models, especially ultra-short-term ones.

The further part of the work presents the procedures for including data from the available APRS system into the IMGW-PIB measurement and observation system. As part of the implementation, Python codes are created. The codes enable downloading, saving to the database and initial quality control of data from amateur meteorological stations. The work

is supplemented by the country's first guide to situating, operating, controlling and assessing the quality of selected measurement data from amateur meteorological stations.