

Good weather forecast is a valuable piece of information. In addition to scientific values, it brings social benefits, often contributing to the reduction of material losses or even the protection of human life. Nowadays, the basic tools used for weather forecasting are numerical models. With the development of the computing power of modern computers, it is possible to calculate the meteorological parameters that occur at a given time and location. Numerical models are also used in downscaling's simulations. Currently, the effectiveness of numerical models (as well as the weather forecast) are increasing with the growth of computing power and the number taken into account of processes occurring in the atmosphere. The main objective of the project is to improve the short-term simulation of downscaling over the Polish area by adjusting the configuration model WRF. This will be done by means of statistical techniques methods of correction (Model Output Statistics). The author of the project will determine testability model WRF for selected meteorological parameters: air temperature, atmospheric pressure, wind speed and precipitation. In addition, the results of probing the atmosphere will be verified to aerogical station. The analysis will help to make the diagnosis for the most common errors of the model and try to reduce them by applying statistical methods.

Tasks will be performed in stages, starting with selecting model resolution and settings for programming - in appropriate combinations (e.g. the setting of microphysics, short-wave radiation and long-term radiation, physics of surface area). Then, throughout the whole year 2019 model calculations will be tested for each version of the simulation. After this period, the verification is carried out on the basis of standard observational meteorological data. The data will be obtained from meteorological stations (over 60), included in the measurement network of Institute of Meteorology and Water Management National Research Institute. Validation of forecast data will be done thanks to the recommendation of the WMO statistical measures, demonstrating the value of forecast error. During the next stage, the results will be improved using statistical methods of correlation (MOS). This in turn will lead to the creation of the best settings for programming model WRF. The project will improve the efficiency and verifiability of short-term weather forecasts over the area of Poland.