Weather and climate are not only important natural resources for tourism and recreation, but may very often be limitations, that make leisure activity outdoors impossible or less satisfying. They shape physical offers, influence peoples’ choices of time and place for vacation, as well as affect the type of activities undertaken during holiday. In recent years urban tourism has gained increased popularity in Poland, therefore in this project we decided to focus on bioclimatic determinants of outdoor activities in the five most popular among tourists and most frequently visited Polish cities: Cracow, Gdansk, Poznan, Warsaw and Wroclaw. The aim of this project is to indicate the most favourable seasons for urban tourism in the selected cities and to determine frequency and seasonal variations of unfavourable meteorological factors hindering sightseeing.

From October to March, at 12 UTC, cold weather of diverse intensity was observed in all cities (Fig. 3). In winter on few very strong cold stress occurred, while in Cracow even extreme cold stress was once recorded (−40°C − 1°C; 1–9). Such biothermal conditions may cause excessive cooling of human organism, if not well protected by highly insulating clothing, and thus reduce possibilities of sightseeing activities. From April (in Gdansk from May) mean UTCI values indicated no thermal stress, although in first and second decades of July in all cities except Gdansk very strong heat stress occurred, when all activity should be reduced to protect organism from heat load.

In all cities in winter at 12 UTC very cold and cold weather prevailed – from 32.7°C in Wroclaw to 50.3°C in Warsaw (Fig. 4). Comfortable conditions most frequently occurred in Gdansk (27%), with maximum in the third decade of July (44.5%). In other cities comfortable thermal sensations were most common in late March or in April. For tourists in urban areas very hot meteorological conditions are unbearable, but fortunately in all selected cities they occurred very seldom and only from May to September. The frequency of very hot thermal sensations varied from 0.2% in Gdansk to 1.9% in Cracow. Such weather was observed most frequently in the third decade of May and in July.

CTIS presents in 10-day intervals the occurrence index of weather conditions important for tourists. To make CTIS more legible we limited its content only to adverse meteorological factors hindering sightseeing and outdoor activities. Criteria for the selection of particular day types are as follows:

- Cloudy days: mean daily N > 65.
- Foggy days: mean daily visibility < 100 m.
- Rainy days: occurrence of at least 1.88 hours.
- Windy days: mean daily > 5 m/s.

Cloudy days are the most commonly observed limitation for tourism in the selected cities (Fig. 5). They occur with a probability higher than 50% in winter. They are most frequent in the second decade of November and the last decade of January (in Warsaw), as well as in the second decade of December (in Poznan and Wroclaw). In the summertime, cloudy days are least probable in Wroclaw. In July and August, sunny days may cause some limitation for tourism, exceeding the 50% probability in the third decade of July in Gdansk, Warsaw and Cracow.

Foggy days occur mainly in winter, with the highest probability in Poznan (over 40% from November to January), while rainy days that limit outdoor activities (> 5 mm), are observed in the selected cities – mainly from May to early September (with maximum of 20% probability). Windy days are registered only in Gdansk, with less than 20% probability.

Weather Suitability Index (WSI) is a numerical measure which evaluates if a given weather type is pleasant and enables maintenance of thermal balance of human organism or not. Final assessment of weather suitability for different types of tourism activities is defined in particular decades on the basis of WSI average values, where:

- Unfavourable weather
- Moderate favourable weather
- Favourable weather

In all cities, meteorological conditions in winter are unfavourable for sun bathing, but very favourable for active outdoor recreation (Fig. 6). The most favourable weather in sun bathing is in the first decade of September in Warsaw, as well as in the last decade of April in Poznan and Warsaw. The best conditions for sightseeing and mild recreation are in all cities in the second and third decade of April. Moreover, September and first two decades of October in Gdansk and Warsaw are also very favourable for this kind of activities. In Gdansk and Wroclaw during the whole year the weather is at least favourable for active recreation and outdoor sports.

In the selected cities most suitable is for active recreation and sports. Best time of the year for sightseeing and mild recreation are second and third decades of April.

References