

FOREST FIRE DANGER IN 2023 FIRE SEASON

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INTRODUCTION

The fire season is considered to be the time of the year when the most favourable weather conditions for the occurrence and spread of fires in forest ecosystems prevail. In Polish climatic conditions, the fire season lasts from April to the end of September. The available information on fires and meteorological conditions during the 2023 fire season was analysed using spatial information systems, in particular their number, location and dynamically changing forest fire danger.

OCCURRENCE OF FOREST FIRES

In last year's fire season, 2,741 forest fires were registered. The highest number of forest fires in the fire season occurred in the Warsaw Regional Directorate of State Forests (RDSF)(528). However, the lowest number occurred in the south of Poland; RDSF Krosno 18 and Kraków 11 events (Fig. 1).



Fig. 1. Total number of forest fires in RDSF in the 2023 fire season.

The areas most affected by forest fires are located in the centre of the Warsaw RDSF. In the south-eastern part of Poland (RDSF Lublin, RDSF Krosno, RDSF Krakow), on the other hand, there are significantly fewer of them (Fig. 2).

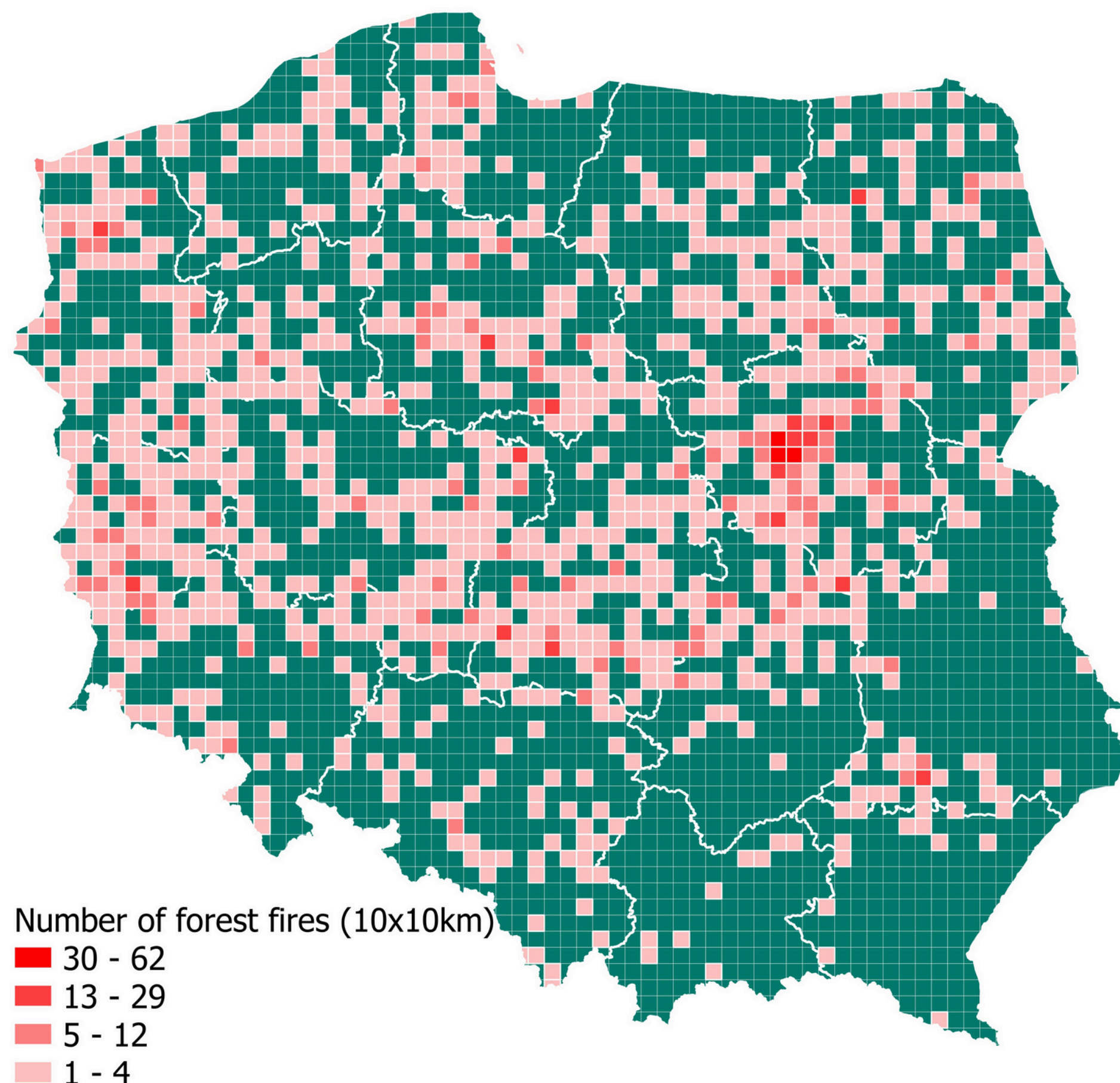


Fig. 2. Location of forest fires in the 2023 fire season.

ANALYSIS OF DYNAMIC FOREST FIRE DANGER

The dynamic forest fire danger in Poland is expressed on a three-level scale based on air temperature, relative air humidity, precipitation and moisture content of pine litter (Fig. 3). The Forest Fire Index (FFI) is determined on this basis. Its calculation is carried out by the Forest Research Institute twice a day (9:00 am and 1:00 pm) during the fire season for each of the 60 forecast zones in Poland.



Fig. 3. Data sources used to calculate Forest Fire Index (from left: weather station, weigh-dryer, pine litter).

The average National Forest Fire Index (NFFI) for the 2023 fire season was 1.0 at 9 a.m. and 1.4 at 1 p.m. These values were close to the average values for the fire seasons calculated for the period 2017-2022. In contrast, the percentage of third-degree of Forest Fire Index for the 2023 fire season was 4.5% at 9 am and 17.3% at 1 pm. The other average values of the parameters considered in the calculation of the FFI reached values that indicate an increase in fire danger in the 2023 fire season compared to the multi-year average of the 2017-2022 period.

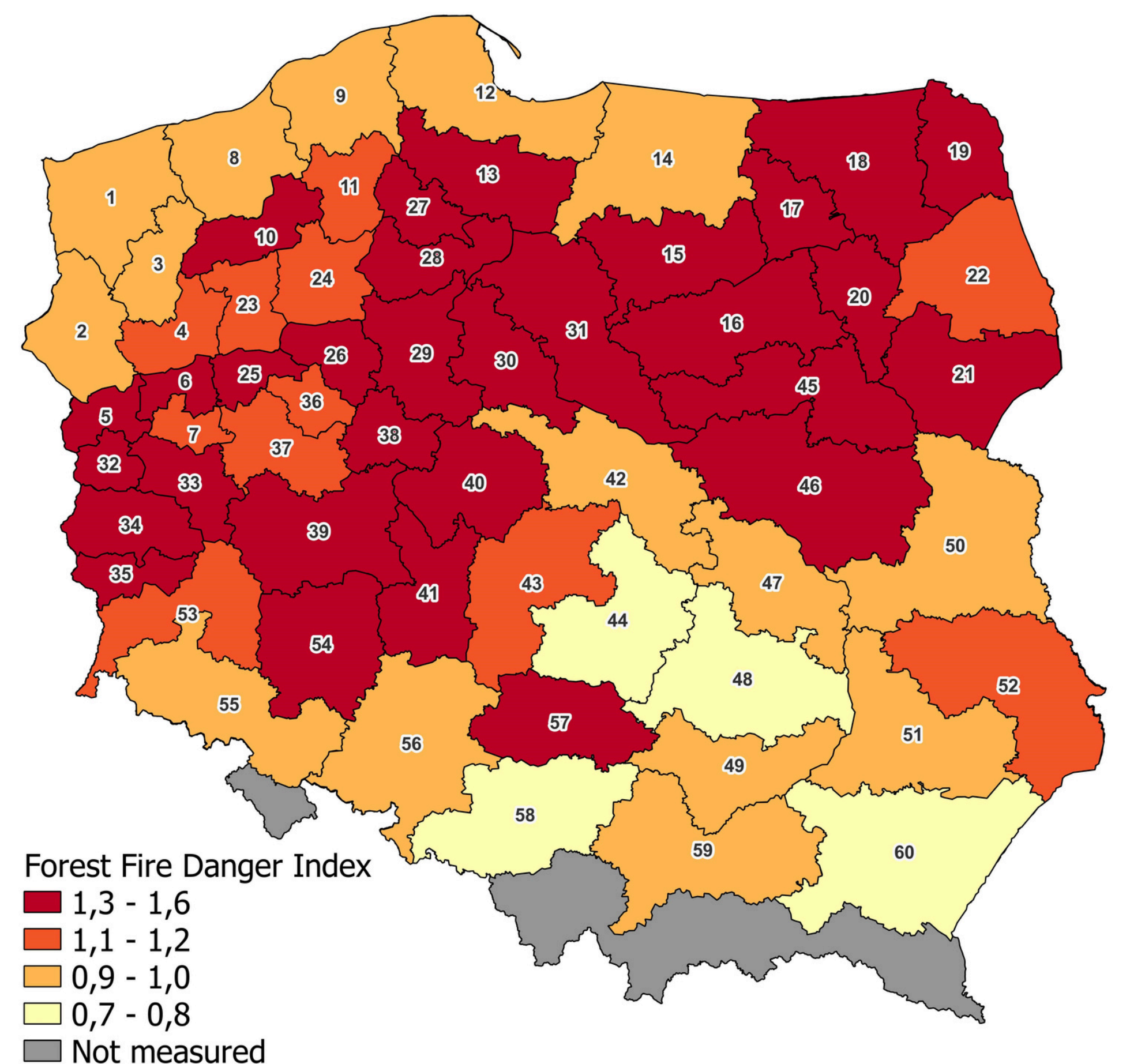


Fig. 4. Average Forest Fire Index for the 2023 fire season and each forecast zone.

SUMMARY

The results of the average FFI for the 2023 fire season in each forecast zone were consistent with the occurrence of fires in these locations. This indicates an accurate assessment of the dynamic fire danger. The National FFI (average value for all zones) at 9:00 am had a very strong correlation coefficient with the daily number of fires and a strong correlation coefficient at 1:00 pm. In last year's fire season, the fire danger was higher compared to the average of recent years, but the total number of forest fires and the burnt area decreased compared to the multi-year average.