

STRONG WIND ON THE TERRITORY OF GEORGIA IN 2014-2018

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***Summary:** 2014-2018 data on strong wind cases ($V \geq 15$ m/s) are considered. The climatic characteristics of strong winds, such as the number of days, wind speed, and direction, are studied for a five-year study period. Also, strong wind distribution areas are defined according to the municipalities. Some cases of damage caused by strong winds in 2014-2018 are described.*

Based on the available data a geoinformation map of the distribution of strong winds in the regions of Georgia are compiled.

***Key Words:** Strong winds, dangerous weather phenomena, climatic characteristics, geoinformation map.*

Introduction

Strong wind is one of the most dangerous weather phenomena. The damage caused by him is significant for the country's economy. Strong winds ($V \geq 15$ m/s) damage infrastructure, pull out trees, carry dust over long distances, interrupt and damage power lines, disrupt air traffic and cause blizzards. It also causes great damage to agriculture, carries fires over large areas, posing a threat to the country's ecological environment. Therefore, the study of the characteristics of strong winds on the territory of Georgia is of great importance.

The peculiarity of the relief that characterizes the territory of Georgia contributes significantly to the development of strong winds. Several works are devoted to its study, in which wind-hazardous regions of Georgia are highlighted [1-4]. Such territories include, for example, the valley of the Rioni River within the Kolkheti lowland, where the maximum wind speed is 66 m/s. on the territory of Kutaisi; The gorge of the Mtkvari river within the Shida Kartli lowland, the maximum speed of 65 m/s is observed at the Tbilisi airport. Mount Sabueti also has a maximum wind speed [2].

Methods and Materials

According to data for 2014-2018, and 2017-2019 in 2019-2021 we have carried out work on other hazardous weather phenomena (hail, rainfall, floods, wind etc.), and conducted an overview of the entire territory of Georgia, as well as individual regions [5-10].

The article examines the cases of strong winds on the territory of Georgia in 2014-2018. The processing of this data, to some extent, makes it possible to identify regions and municipalities where the threat of strong winds has recently been observed. The study also analyzes the dynamics of the strong winds and trends over the study period.

Strong wind data provided by the National Environment Agency. The work was carried out using the methods of probability theory and mathematical statistics [11-12].

Results

Table 1 below, compiled as a result of processing data on strong winds in 2014-2018. The table shows data on the number, speed, direction and areas of distribution of days with strong winds in the regions of Georgia.

Table 1. Strong wind incidents in the regions of Georgia in 2014-2018

Region	Distribution Area (Municipality)	Number of days	Wind speed (m/s)	Wind direction
Adjara	Batumi, Kobuleti, Keda, Khelvachauri	22	16-28	West, North-west, South-west, East
Kakheti	Telavi, Kvareli, Gurjaani, Lagodekhi, Sagarejo, Dedoplistskaro, Signagi, Akhmeta	22	20-30	West, North-west, East
Shida Kartli	Gori, Khashuri, Kaspi	8	15-25	West, North-west
Kvemo Kartli	Tsalka, Bolnisi, Tetri Tskaro, Marneuli, Rustavi, Gardabani	10	24-31	West, North-west
Imereti	Kutaisi, Chiatura	13	20-30	East, West, South-west
Guria	Ozurgeti, Chokhatauri	12	-	West
Samegrelo - Zemo Svaneti	Poti, Zugdidi, Tsalenjikha, Chkhorotsku, Senaki	16	15-30	East, West, North-west
Samtskhe-Javakheti	Akhalkalaki, Borjomi	3	18	West
Raja-Lechkhumi and Kvemo Svaneti	Oni, Ambrolauri	3	22	West
Mtskheta-Mtianeti	Dusheti, Mtskheta, Kazbegi	9	18-31	West, North-west, South-west, East
Tbilisi	Tbilisi, (Digomi, Airport)	22	18-33	North-west, West

As can be seen from Table 1, during the five-year study period (2014-2018), strong winds are observed throughout Georgia. If we consider the regions, then by the high number of days the regions of Adjara, Kakheti, and Tbilisi stand out, wherein 2014-2018, 22 days were observed in each of them when the wind speed exceeded 15 m/s ($V \geq 15$ m/s). The smallest number of days is observed at a wind speed of $V \geq 15$ m/s in the regions of Samtskhe-Javakheti and Racha-Lechkhumi Kvemo Svaneti (3-3 days).

As for the wind speed, the maximum was recorded at the Tbilisi airport and amounted to 33 m / s. In addition, high wind speeds (30-31 m / s), as shown in Table 1., are observed in several regions of the country (Kakheti, Kvemo Kartli, Imereti, Samegrelo-Zemo Svaneti, Mtskheta-Mtianeti).

The region of Kakheti is distinguished, where the zone of distribution of strong winds during the five years of research covers the entire territory of the region and is observed in all municipalities.

As for the direction of the wind, the winds of the western direction prevail throughout the territory of Georgia. Northwest winds are also frequent. Eastern winds are also often observed in western Georgia. Based on Table 1, a geoinformation map of the distribution of strong winds has been compiled, which shows the strong wind situation in the regions of Georgia in 2014-2018 by the number of days.

Fig. 1 shows the wind hazardous areas identified in 2014-2018. The number of days with strong winds over the five-year study period is distributed from 3 to 22 days across regions.

As mentioned in the introduction, strong winds can cause significant damage. This is evidenced by the cases of damage from strong winds described in the data for 2014-2018. For example:

On March 17, 2014, in Gurjaani (Kakheti region), high-voltage power lines and roofs of houses were damaged by strong winds. In Kakheti, 3,000 subscribers were disconnected from electricity;

On March 29, 2015, in Zugdidi (Samegrelo-Zemo Svaneti region), a strong wind damaged the roofs of 100 houses, knocked down trees, and damaged 10 cars. Due to damage to power lines, electricity was cut off to 20,000 consumers. 6 villages of Chkhorotsku suffered significant damage. 3 public schools in Zugdidi were damaged.

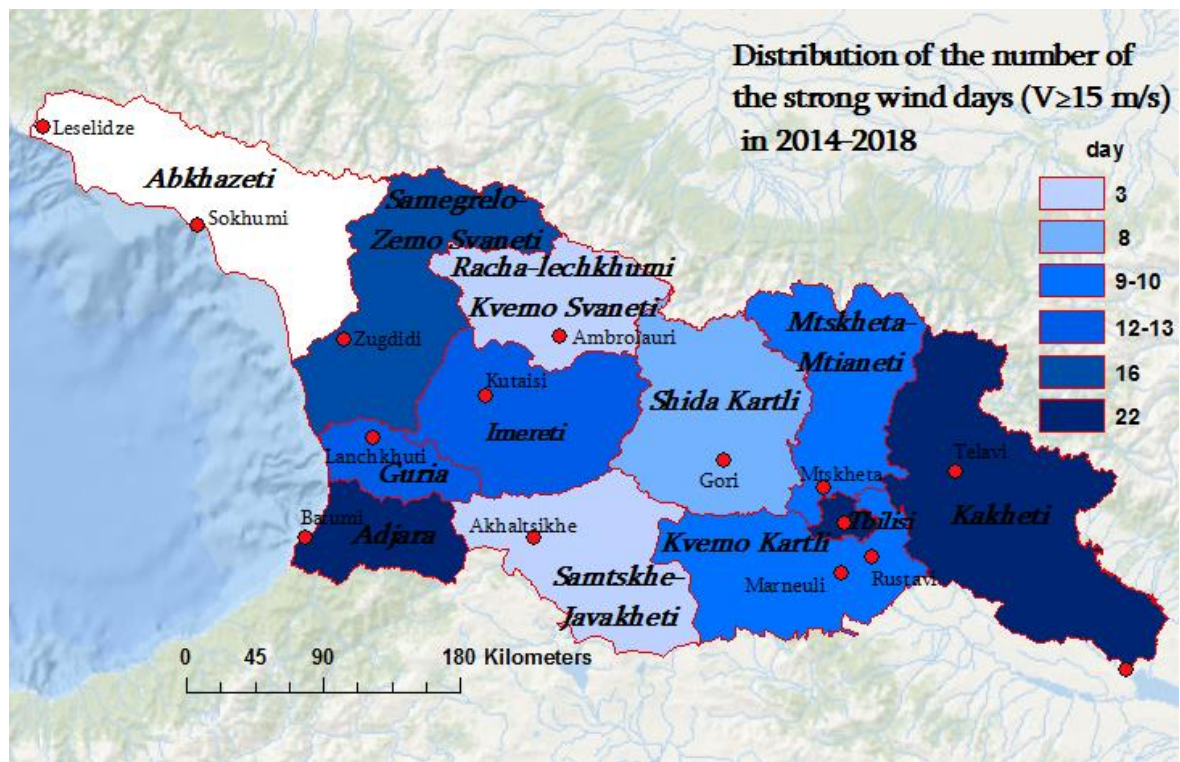


Fig.1. Distribution of the number of days with strong winds ($V \geq 15$ m / s) in 2014-2018, by regions of Georgia

On April 21, 2016, due to strong winds at Tbilisi International Airport, 8 flights were canceled, as a result of strong winds in the area of the Delisi metro station and on December 5 street in Tbilisi, cars and power lines were damaged. Strong winds created problems in Rustavi, uprooted perennial trees, damaged power lines and roofs.

On October 16, 2017, a magnolia tree fell in Batumi Park (Adjara region), a strong wind blew off the roof of Batumi State University.

On November 30, 2018, in Kutaisi (Imereti region), flights were delayed due to strong winds, roofs of about 150 houses were damaged, and trees were uprooted.

Several examples given show that strong winds can cause significant damage to a country, so it is important to study its climatic conditions and characteristics in terms of taking preventive measures.

Conclusion.

As a result of a study based on data from 2014-2018. Three regions of Georgia (Adjara, Kakheti and Tbilisi) were identified, where, in comparison with other regions, cases of strong wind are especially frequent.

On the whole territory of Georgia, according to the five-year study period, westerly and north-westerly winds prevail.

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