Journal of the Georgian Geophysical Society, e-ISSN: 2667-9973, p-ISSN: 1512-1127
Physics of Solid Earth, Atmosphere, Ocean and Space Plasma, v. 25(2), 2022, pp. 24 - 28

Heavy Snow and Avalanches on the Territory of Georgia in 2014-2018

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ABSTRACT

Heavy snow and avalanches are frequent in Georgia during the cold period of the year. The development of these natural disasters is causing significant damage to the country's economy. Heavy snow and avalanches cause road closures and delays, damage to infrastructure, endanger human health.
The paper examines cases of heavy snow and avalanches for the period 2014-2018. Based on the data of the National Environment Agency, a table of cases of heavy snow and avalanches has been compiled by regions of Georgia.
Based on the table, a geo-information map of heavy snowfall and avalanches has been compiled for the study period, showing the municipalities where natural disasters occurred.
Cases of damage caused by heavy snow and avalanches in 2014-2018 are reviewed and described.

Key words: *Avalanche, heavy snow, natural disasters, geoinformation map.*

Introduction

Natural phenomena in Georgia are not so rare at any time of the year. Especially noteworthy is the winter period. It is a known fact that most of the territory of Georgia features mountainous and mountainous regions. Therefore, such natural phenomena as heavy snowfalls and avalanches cause significant damage to mountainous areas - they damage infrastructure, impede movement, and threaten civilians' health [1; 2]. The study of heavy snowfalls and avalanches is vital, given that developing winter resorts is one of the priority areas of the Georgian economy. Their position is especially noteworthy in recent times. Against the backdrop of climate change, which has been developing since the second half of the 20th century.

One can observe the activation of various natural phenomena. There are documents and studies dedicated to heavy snowfalls and avalanches, both now and in the past [3-5]. Preventing damage to them has always been on the agenda.

Materials and methods

This article briefly considers cases of heavy snowfalls and avalanches on the territory of Georgia in 2014-2018. Based on the available study, some characteristics of these cases are analyzed.
The data was provided by the National Environment Agency.
The study is processed using proven methods of mathematical statistics and probability theory in climatology.

Results

Heavy snowfalls and avalanches developed on the territory of Georgia with varying frequency and intensity in 2014-2018. All these cases are classified according to the regions and municipalities. They are present in a corresponding chart (Table 1). Table 1 also indicates the settlements and areas where heavy

snowfall and avalanche cases have been recorded. As well as the processes during which the catastrophe developed.

Table 1. Distribution of heavy snowfall and avalanche cases in 2014-2018 on the territory of Georgia

Region	**Municipality**	**Populated area**	**Causing process**
Abkhazia	-	-	-
Adjara	Batumi, Khulo, Shuakhevi, Kbuleti, Khelvachauri, keda.	Batumi, Khulo, Shuakhevi, Goderdzi pass, Kobuleti, Khelvachauri, Bodzauri, Peria, Zeda gantiadi, Tsablana, 1 May, Zvare, Pushrukauli, Iakobidzeebi, Oshinakhevi, Khabelashvilebi	Western process, Cycle process
Imereti	Tskaltubo, Tkhibuli, Kharagauli	Tskaltubo, Naqerali pass, Moliti	Western process
Samegrelo-upper Svaneti	Mestia	Ushguli (Chdjashi), Djvari-khaishi part, Tetnulda	-
Racha-lechkhumi Lower Svaneti	Ambrolauri, Tsageri, Lentekhi, Oni	Tkhibuli-Ambrolauri road, Tsageri, Lentekhi, Oni-Shovi 15th km	Cycle process
Guria	Chokhatauri, Ozurgeti	Bakhmaro, Ozurgeti	Western process
Shida Qartli	-	-	-
Qvemo Qartli	-	-	-
Samtskhe-Javakheti	Ninotsminda, Akhaltsikhe, Adigeni	Akhaltsikhe, Ninotsminda, Adigeni.	Cycle process, Western process
Mtskheta-Mtianeti	Dusheti, Stepantsminda	Jinvali-barisakho road, Pshavi (chargali), Ananuri, Pasanauri, Gudauri, Nabeglavi, Mleta, Djuta, Khanobi, Jvari pass besides the Traverta, Arakhvneti, Kobi- 1 and 2 inbetween tunnels, Kobigudauri kobi, Mleta, Bedoni.	Cycle process, Increase of the snow height intensively, Thermal process, Dramatic increas of the temperature
Kakheti	Akhmeta	Tusheti road	East process

Table 1 shows that, compared to other regions in Georgia in the Adjara and Racha-Lechkhum Kvemo Svaneti, cases of heavy snowfalls and avalanches are more frequent.

During the study period, natural disasters were registered in all municipalities. Western processes in the area were the main causes of heavy snowfalls and avalanches area. Dusheti and Stepantsminda municipalities of the Mtskheta-Mtianeti region are also exceptional on the mentioned topic, where natural disasters were observed in dozens of places, on central and internal highways, passes, and crossings. Within all the processes that cause heavy snowfalls and avalanches, The research contains a sharp increase in temperature, a thermal process, intense snowfall, etc. records For the Mtskheta-Mtianeti region.

Based on Table 1, we have compiled a geoinformation map (. 1), which shows the distribution of cases of heavy snowfalls and avalanches in 2014-2018. by municipalities in the territory of Georgia.

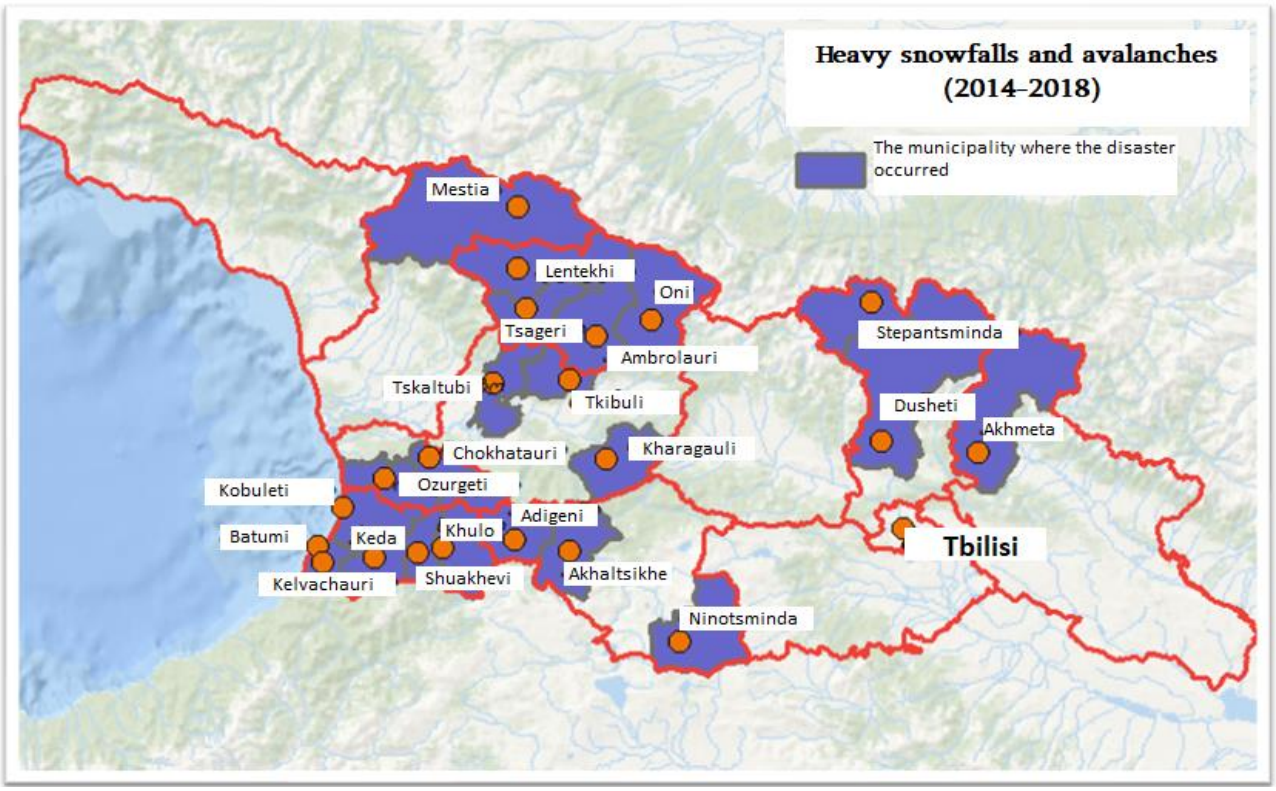

Fig.1. Heavy snowfalls and avalanches, according to municipalities from 2014-2018 years

The map represents territories and municipalities with heavy snowfalls and avalanches recordings in 2014-2018. In some cases of which, heavy snowfalls and avalanches caused damage to settlements or road infrastructure. Accordingly, the Geoinformation map is built with this exact information. As mentioned, heavy snowfalls and avalanches are among the natural disasters that destroy infrastructure, cause loss of life, causing significant damage and loss to the country, especially to municipalities in mountainous and high mountain areas. The list of such cases is numerous, from 2014-2018. Here is a description of some cases, provided by the National Environment Agency:

Five extremists got caught, and unfortunately, four of them passed away during the avalanche in the municipality of the Mestia (Chadjimi) in 2014 on 7 march;

Four civilians got caught during the avalanche in the Chokhatauri municipality, the disaster caused the death of one of them sadly;

In 2016 on 12 December, an avalanche in the Svaneti caused the death of one civilian, the disaster took place at the connecting road of Khashimi and Jvari, a local civilian was driving the minibus when he got caught in the avalanche.;

In 2017 on the 2nd of January, heavy masses of snow demolished the house of a local and caused an unfortunate death;

In 2017 on 13 March, the extrimist got caught under the masses of snow caused by an avalanche and passed away, tragedy took place in Khazbegi municipality;

In 2017 on 14 May, one civilian passed away due to an avalanche in Tusheti, on the 43km road of Pshaveli-Omali;

In 2018 on the 4th of January, extremists got caught in an avalanche and passed away in Tetnuldi mountain resort.

In 2016, on 24 January in Batumi snow coat was one meter high. The seaside town was practically paralyzed transportation was hardly possible on main roads only with specific automobiles. In Adjara, Heavy

snowfall caused electron energy blackouts for about 1500 locals. The light source got cut out for the Batumi and Khelvachauri regions as well.

2017s heavy snowfall on the 1st of January caused the village Zemo Peria, Municipality of Khelvachauri, a fatal tragedy the civilian got caught up in the ruins of his house and passed away.

The cases described and the damage from natural disasters that are shown in these cases indicates, how important it is to take various preventive measures and reduce the consequences of expected heavy snowfalls and avalanches.

Conclusion

A study that covers the 2014-2018 years of analysis of the heavy snowfalls and, avalanches, shows natural disaster circulates in Adjara and Racha-Lechkhumi Qvemo Svaneti most of the time when it comes to western Georgian regions, but for the eastern regions of Georgia Mtskheta-Mtianeti region, especially in Dusheti and Kazbegi municipalities.

The research is done with the support of "Shota Rustaveli national scientist faundation" [Grant number - FR-21-1677].

The study report was represented at the II International Scientific Conference Landscape Dimension of Sustainable Development: Science, CartoGis, Planning, Governance, which was held on September 12-16 in Tbilisi, st. Javakhishvili of Tbilisi State University, and was dedicated to the 75th anniversary of the birth of the outstanding Georgian geographer-cartographer, Professor Nikoloz (Niko) Beruchashvilis' 75th anniversary of his birth. The abstract of the article is published in the collection of conference abstracts (pp. 211-212), in Georgian and English languages. (https://icldscartogis.tsu.ge/assets/media/uploads/images/abstracts_book_2022.pdf).

The authors thank the M.Nodia Institute of Atmosphere Physics department headman Avtandil Amiranashvil for the work support.

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დიდთოვლობა და ზვავები საქართველოს ტერიტორიაზე 2014-2018 წლებში

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რეზიუმე

საქართველოს ტერიტორიაზე დიდთოვლობა და ზვავები წელიწადის ცივ პერიოდში ხშირი მოვლენაა. ამ სტიქიური მოვლენების განვითარება იწვევს მნიშვნელოვან ზარალს ქვეყნის ეკონომიკისთვის. დიდთოვლობა და ზვავები იწვევს გზების გადაკეტვასა და გადაადგილების შეფერხებას, ინფრასტრუქტურის დაზიანებას, საფრთხის ქვეშ აყენებს ადამიანთა ჯანმრთელობას.

ნაშრომში შესწავლილია დიდთოვლობისა და ზვავების შემთხვევები 2014-2018 წლების პერიოდისთვის. გარემოს ეროვნული სააგენტოს მონაცემების საფუძველზე შედგენილია დიდთოვლობისა და ზვავების შემთხვევათა ცხრილი საქართველოს რეგიონების მიხედვით.

ცხრილზე დაყრდნობით, საკვლევი პერიოდისთვის შედგენილია დიდთოვლიანობისა და ზვავების გეოინფორმაციული რუკა, რომელიც ასახავს იმ მუნიციპალიტეტებს სადაც განვითარდა სტიქიური მოვლენები.

განხილულია და აღწერილია 2014-2018 წლებში დიდთოვლობისა და ზვავების შედეგად მიყენებული ზარალისა და ზიანის შემთხვევები.

საკვანძო სიტყვები: ზვავი, ძლიერი თოვლი, სტიქიური უბედურებები, გეოინფორმაციული რუკა.

Сильные снегопады и лавины на территории Грузии в 2014-2018 гг.

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Резюме

На территории Грузии в холодный период года нередки сильные снегопады и сход лавин. Развитие этих природных явлений наносит значительный ущерб экономике страны. Сильные снегопады и лавины приводят к перекрытию дорог и нарушению движения, повреждению инфраструктуры, созданию опасности для здоровья людей.

В работе рассмотрены случаи сильных снегопадов и лавин за период 2014-2018 гг. На основании данных Национального агентства по окружающей среде составлена таблица случаев сильных снегопадов и сходов лавин по регионам Грузии.

На основании таблицы составлена геоинформационная карта обильных снегопадов и лавин за исследуемый период, на которой отмечены муниципальные образования, где происходили стихийные бедствия.

Обсуждаются и описываются случаи убытков и повреждений, вызванных обильными снегопадами и лавинами в 2014-2018 гг.

Ключевые слова: лавина, сильный снегопад, стихийные бедствия, геоинформационная карта.