

Dangerous Meteorological Phenomena in Georgia

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Georgia is characterized by the exceptional variety of dangerous, including catastrophic, meteorological phenomena that often cause significant material damage as well as human casualties. These dangerous meteorological phenomena often occur simultaneously and exacerbate the situation. For example, wind amplification during a rainstorm, fog during a snowstorm, a hurricane during hailstorm, etc. To reduce the negative consequences of such phenomena, knowledge of the physical process of their implementation in a given area is necessary.

The following combinations of catastrophic meteorological phenomena are most dangerous in Georgia:

- Catastrophic precipitation – hurricane wind (R50-Hu);
- Catastrophic precipitation – hazardous fog (R50-Fd);
- Hail – hurricane wind (Ha - Hu);
- Hail – dangerous fog (Ha-Fd);
- Hurricane wind – dangerous fog (Hu-Fd);
- Snowstorm – dangerous fog (B-Fd);

where R50 – is a catastrophic precipitation, when the daily precipitations exceed 50 mm, Ha–hail, and Hu – hurricane wind, when the wind speed exceeds 32 m/sec, B – snowstorm, and Fd –dangerous fog, when the visibility range is less than 50 m.

The listed meteorological phenomena are independent of each other; therefore, the physical process of their occurrence has a stochastic character and it can be studied as a random process based on the theorem of multiplication and addition of probabilities known in probability theory. Using these theorems, the stochastic process of realization of various combinations of dangerous meteorological phenomena is studied based on the data of several meteorological stations in Georgia.

References

- [1] E.Sh. Elizbarashvili, M.E. Elizbarashvili, Natural meteorological phenomena in the territory of Georgia. (2012) 104.
- [2] M. Elizbarashvili, E.Elizbarashvili, Modeling of Stochastic Process of Implementation of Various Combinations of Dangerous Meteorological Phenomena in the Mountains of the Caucasus. Ankara Üniversitesi Çevre Bilimleri Dergisi, 7(2), 1-7 (2019).