VERY STRONG WINDS IN LITHUANIA AND THEIR IMPACT ON POPULATION DURING 1999–2007

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I. INTRODUCTION

Strong winds and storms are not a rare phenomenon in Lithuania. A wind to 15 m/s strong becomes a dangerous meteorological phenomenon. Lithuanian seaside encounters winds over 15 m/s averagely 30-35 days, while Central and East Lithuania – only 5-9 days (Bukantis, 1994).

A very severe (elemental) storm is defined by Lithuanian legislation when wind speed is reaching 28-32 m/s. Hurricane wind speed is considered from 33 m/s and above (Augulienė, 2006).

Uprooted trees and unroofed buildings, disrupted airport and seaport operations, road and rail traffic, hundreds of thousand people left without electricity account for only a part of damage caused by the very strong winds. Quite often they cause human injuries and even claim their lives.

The purpose of this research is to identify events with wind speed reaching 30 m/s in the years from 1999 to 2007, to review preceding synoptic situation and the damage caused to human population.

II. PRESENTATION OF RESEARCH

Selected research period starts from 1999 with its December marked by raging hurricane Anatol that has caused very much damage to Lithuania. For the last time, a very strong storm occurred in January 2007.

The selected 30 m/s wind speed threshold originates from previous legislation defining elemental phenomena. On the other hand, there have been no data on wind damage collected for weaker wind.

During the research period, there were 5 cases when at least one meteorological station recorded wind speed reaching 30 m/s.

Date	Maximum wind speed (m/s)
3-4 December 1999, The storm Anatol	40
31 October - 1 November 2001	32
29 January 2002	34
8-9 January 2005, The storm Erwin	37
15-16 January 2007, The storm Per	32

TABLE I: Cases of wind speed reaching 30 m/s and over during 1999-2007

The most favourable conditions for the wind to increase its speed to dangerous threshold are forming in the rear of a deepening cyclone tracking from the west. In studied cases, cyclones most often had been originating over the Atlantic slightly north of Ireland. They tracked and deepened over the southern part of Scandinavian Peninsula towards Finland, reaching their maximum development phase over the South Sweden or the Baltic Sea (with central pressure 955-975 hPa) and then started to fill.

In all investigated cases the strongest wind had been in seaside, gradually weakening while tracking to the east.

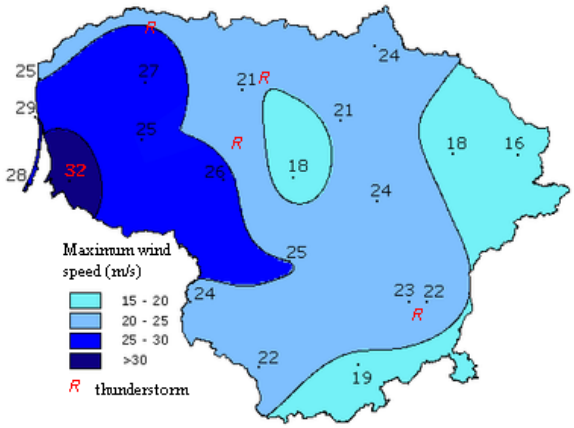

FIG. 1: Maximum wind speed (m/s) on 14–15 January 2007

Data on the damage were gathered using descriptions of elemental meteorological phenomena compiled from data collected by meteorological and climatological stations. Elemental winds are observed by all meteorological stations, but climatological stations are not equipped with wind gauges and are assessing wind speed by its damage using Beaufort scale. However, principal information was obtained by summarizing media communications published by various institutions as there is no precise record of the damage caused by elemental phenomena in the country.

Every storm and especially a hurricane are heavily impacting the sea coast. Every consecutive time the wind further erodes the sea coastline and its fortified sand dunes and even washes away beaches in some places. Strong winds sometimes cause wave surge raising water stage in nearby rivers with subsequent flooding of roads and houses.

The largest numbers of people were injured in December 1999 when the hurricane claimed also 2 human lives, fortunately for the last time to date. But a heavy damage was caused to the sea port and power grid companies and many people were left without electricity.

III. RESULTS AND CONCLUSIONS

This work investigated 5 cases of strong wind in Lithuania since 1999. Examination of their synoptic situation led to a conclusion that the most dangerous winds raised in the rear zone of deepening cyclones forming north of Ireland.

Research resulted in mapping spatial distribution of wind speed and related damage. The most endangered

regions shall be given additional warnings. Almost all cases resulted in causing damage to people.

IV. AKNOWLEDGMENTS

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