

IMPACTS OF WEATHER AND ITS FORECAST ON TRANSPORT

JAROSOVA Miriam¹, IGAZ Dusan²

¹ *University of Zilina, Faculty of Operation and Economics of Transport and Communications Air Transport Department, Slovakia, EU*

² *Slovak University of Agriculture in Nitra, Horticulture and Landscape Engineering Faculty, Slovakia, EU*

Abstract

Each kind of transport is very sensitive to weather and its conditions, which might change in a short period of time. Proper information about the current weather is very useful in order to schedule the transportation. Information about the weather and its prediction could be obtained from diverse sources for waste areas all around the world. One of the most useful sources of meteorological weather predictions are the weather numerical outputs. These outputs must be correctly interpreted for numerous types of users.

The data are delivered with various validity periods and in different forms. The information about weather and its correct explanation may produce better economical results

Keywords: Transport, weather, numerical weather prediction

1. INTRODUCTION

Weather has a great impact on the quality and the accuracy of traffic.

Frequently, the traffic is slowing down on unexpected weather conditions, and there is a risk of failure to meet deadlines. That is why, in the current fast-growing period, high-quality accurate and direct weather forecasting is in the forefront of quality logistics for all modes of transport.

The weather has shown its great impact on transport in history. Let's recall the tragedy of the Hindenburg airship. When the airship landed in May 1937, the airship burst into the air. It is speculated about the numbers of reasons, from static electricity to the cold front, and its lightning, which ignited hydrogen in the air-ship [1].

There is no need to go so far in history.

Let's just mention the great tragedy on the Island of Tenerife. Here, in March 1977, more than 300 people died in the crash of two aircrafts. The cause of the tragedy was fog [2].

Numerical model started to be used in meteorological forecast app 20-25 years ago. But its foundations have been laid in the 50's of the last century, but with the boom of IT, numerical models are increasingly becoming part of everyday practice.

2. CURRENT STATE

With the current volume of traffic, information on the weather and on-site destination appears as a very important information.

It should be remembered that each type of transport needs different weather information to ensure transport safety.

At the present time, predictive meteorological numerical models are used to ensure good weather forecasts for transport. They use all known mathematical, physical equations describing condition in atmosphere and current meteorological data from a large area of the world. The meteorological model provides broad meteorological data for the meteorologist to produce good weather forecasts for different users. The meteorologist has everyday updates of the predictive model on a different area.

The model has a different resolution of area to predict atmospheric conditions. The 10x10 km area is the most common, but the resolution of 2x2 km is often used only when predicting local phenomena, e.g. a wind sheer, amount of precipitations, snow or thunderstorm.

The numerical model also provides automatic prediction, but the meteorologist improves its predictive quality by its interpretation.

3. OUTPUTS OF MODEL

Each meteorological element has its output up to several hours ahead, usually 72 hours in advance.

Based on this information, the meteorologist is able to prepare a relevant prediction for a larger area or point.

The figures show the outputs of the humidity model used for rainfall modeling for Central Europe (**Figure 1**) and CZ / SK (**Figure 2**).

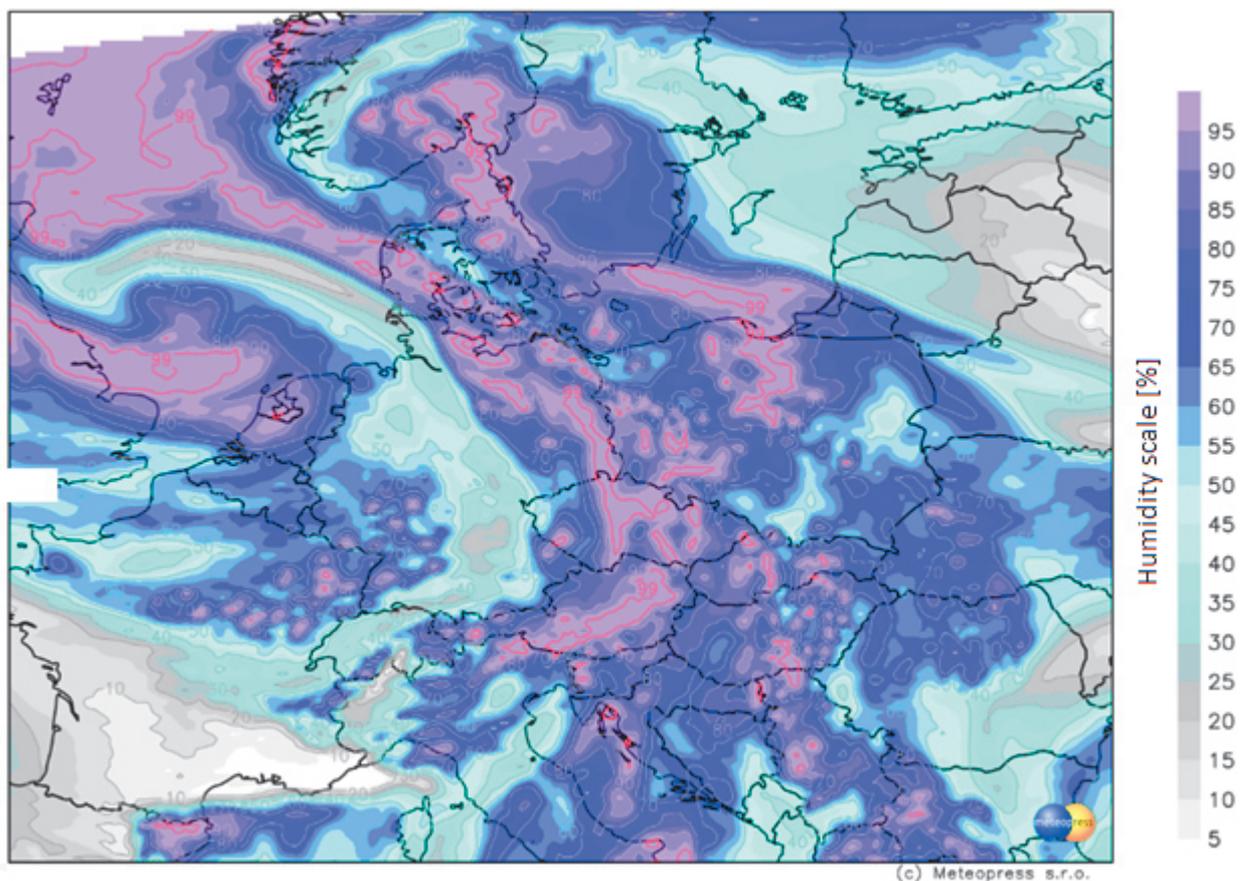


Figure 1 Humidity output for Central Europe

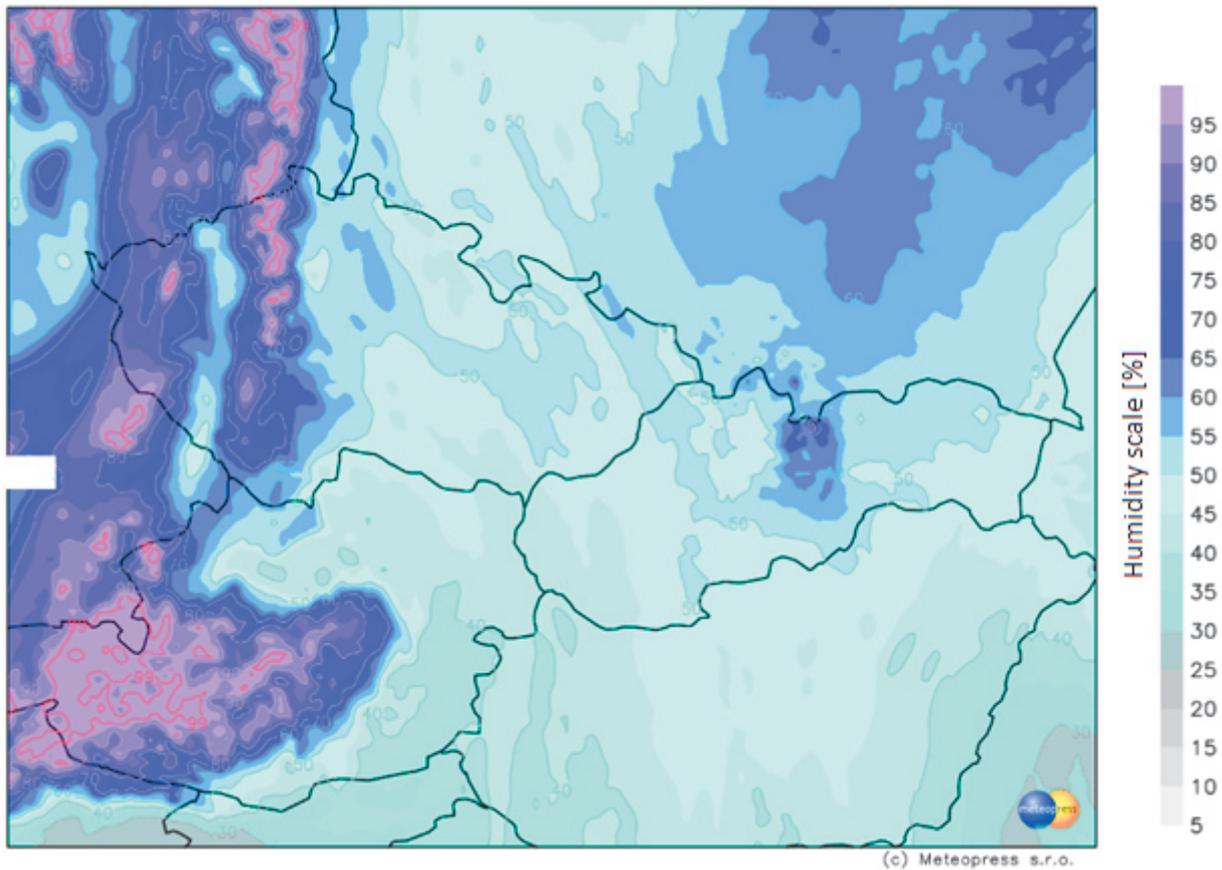


Figure 2 Humidity output for CZ/SK

4. CONCLUSION

Numerical models are a useful source of weather information for a wide range of transport users. They provide information for secure logistics in rail, road, water and air transport. Proper interpretation of model outputs brings savings in time and money for all types of transport companies.

REFERENCES

- [1] Airships.net, The Graf Zeppelin, Hindenburg, U.S. Navy Airships, and other Dirigibles [online]. 2009, [27.4.2017]. © Dan Grossman 1997-2017, Available: <http://www.airships.net/hindenburg/disaster/>.
- [2] 1001crash.com, Lessons learnt for aviation safety [online]. 2017, [27.4.2017]. 1001 Crash Copyright © | 2005-2017, Available: <http://www.1001crash.com/index-page-tenerife-lq-2.html>.