MASTERCOM
Politehnica Graduate Student Journal of Communication
Volume 4, Issue 1, 2019

Discursive strategies in communication of vulgarization of specialized information – communication of severe weather events

Vlad Mărăzan

Abstract: *Among the most frequent hazards in daily life are severe weather events. These phenomena have a short or medium time range, but they are very powerful and produce significant damage. Operational meteorology tries to foresee these phenomena as long as possible prior to their appearance, but sometimes there are communication disturbances in distribution of the meteorological information toward the competent authorities and the population. The goal of this paper is to present some forecast or communication errors concerning some severe weather events that occurred in the Western part of Romania between 2005 and 2017.*

Keywords: *operational meteorology, crisis communication, severe weather events, operational meteorology, communication strategies, emergency situations*

1. Introduction

Violent manifestation of certain weather phenomena, material and human damage resulting after these have led to the necessity of their real-time monitoring. Operational meteorology tries to limit the effects of dangerous weather phenomena by issuing weather alerts as accurate as possible concerning dangerous meteorological phenomenon or phenomena and their localization with a reasonable anticipation degree of at least ten to fifteen minutes before the appearance of the phenomenon. The interest for weather forecasts in general is emphasized by the high number of contracts concluded with media customers but natural persons also, who want to be informed accurately on the weather.

However, operational meteorology cannot include innovative communication methods of dangerous weather phenomena. For this reason, the alert coming from meteorologists must be processed by persons experienced in the field of communication but meteorology also so that they can issue correct alerts and the population to be informed correctly on the dangers that may arise. Unfortunately, the weather forecast in television broadcast are in general presented by persons not specialized in the field so that there are high risks in correct dissemination of the specialized information to the wide audience. This audience does not have the time to process the information and to search for other information sources, so they will not fully understand the transmitted information.

Scientist in the field claim that the most important part of crisis in the first place the management of information communication (internal and external) so that the crisis is some kind of rupture event that on one hand requires intense internal communication within an organization or an authority and the communication with external partners on the other hand (Chiciudean & David, 2011, p. 83).

2. Methods

In case of dangerous weather phenomena, it is very important to distinguish between what the forecast models show and what the instruments for immediate analysis of the weather situation show (Doppler RADAR). Forecast models can offer a general view on certain phenomena that may occur in a geographical area and with the immediate forecast instruments corrections can be made or even new forecasts for a very short time period can be issued. (Marazan, 2017)

In order to simplify the research stage concerning meteorology I chose to use in the analysis of the meteorological factors as much as possible meteorological variables. The table below shows these variables and the measuring units used in operational meteorology in order to issue alerts for dangerous weather phenomena.

Another element taken into consideration is the instability indicators set. According to the intensity of the weather phenomenon, the analysis of these indicators will be used in order to show the intensity and type of the phenomenon. Thus, we try to gather data as accurate and real as possible in order to analyze the communication situation.

The data concerning instability indicators and the analysis of air measurements are used in a post-processed data model, in the sense that gross data would be too difficult to interpolate in a paper of this extend. So, data from the European Center for Medium Weather Forecast in Reading, UK are used.

Besides the analysis of the synoptic situation, the forecast of a convective situation is done by aid of instability indicators, too. These are determined by data obtained from air measurements of by numerical models. The data presented in Chapter IV are obtained by running the models ALADIN, ECMWF or ALARO. Instability indicators were ran the K Index (George Index), TTI (Total Totals Index), Boyden Index, SWEAT – Severe Weather Threat Index or Threat Score, the Lifted Index, Temperature-Humidity Index (ITU) and the CTI (Cross Totals Index) (Marazan, 2018, p. 29).

Compared to the communication models, these are relatively low researched in the operational meteorology. The analysis method I suggest is based on the alert time and the communication method of the weather alert. Another analysis criterion are the actions of the competent authorities (Emergency Situations Response Authority, Prefect´s Office and the County Council) in order to limit the effects of dangerous weather phenomena.

Communication channels are the third evaluation criterion in the analysis of these phenomena. Although until 2010 only one official communication channel for such weather phenomena existed, we can say that these diversified in the past years, so that we have now more communication channels of these potential hazards of atmospheric origin. From these means we can count:

- official website of the National Meteorological Administration (www.meteoromania.ro);
- audio-visual communication channels (Radio, TV);
- alert apps of the Department of the Interior (RO-ALERT);
- other alert means using radio waves (only in army use);

Concerning language, we will analyze the vocabulary type used. Normally, in operational meteorology a specialized vocabulary and language with medium difficulty for the non-specialized population is used.

3. Results

After analyzing the five cases of severe weather phenomena we obtained concrete results concerning the monitoring system, forecast, alert, communication and diagnosis of such phenomena.

The five analyzed cases are as follows:

1. Mesoscale Convective System (MCS) from June 11th, 2009
2. Mesoscale Convective System (MCS) from July 7/8th, 2009
3. Convective system from de April 30th, 2009
4. Supercell convective system from July 14th, 2008
5. Derecho (pre-frontal storm line) from September 17th, 2017

The analysis of these phenomena has been presented detailed in another research, published within a conference indexed ISI-Thomson Reuters. From meteorological point of view, the analysis of these cases allowed the evaluation of the forecast, communication and diagnosis system of the atmospheric situation at the moment of the weather phenomena presented (Mircov, Okros, Cozma, Nicolin, & Marazan, 2018).

From operational point of view, weather alerts have been issued, so we cannot speak of fault of the meteorologists. From communication point of view, there have been cases that raised large question marks concerning the alert system for the population and the way these alerts have been communicated. The main problem that appears in case of an extreme weather phenomenon is in the first place the complexity of the inter-institutional alert system.

The second problem identified in the analysis is the steps that have to be followed in order to issue a weather alert. The elaboration scheme of the forecast is much too complicated and does not allow, as seen in case of the phenomenon from September 17th, 2017, to warn in time the population.

Furthermore, we observe the fact that the decisions to issue an orange and red code alert belongs completely to the National Forecast Center in Bucharest. The problem of centralization of the forecast system is extremely dangerous in case of dangerous weather phenomena due to the time lost with fulfilling all procedures stipulated in the forecast manual.

The third big problem identified is the unwillingness of meteorologists to issue a more severe alert in case of phenomena that can become even more severe. Together with the centralization of the forecast, this reluctance lead to the tragic consequences of the weather phenomenon form September 17th, 2017.

In the first place, the biggest problem identified is the use of a much too specialized language in the formulation of weather alerts. It is true that alerts in a specialized language are necessary, but generally the population cannot fully understand what alerts are issued in the information bulletins.

Furthermore, on a different note, the lack of an efficient alert and communication system in case of imminent dangerous weather phenomena is a large problem. The simple alert by website is not a viable solution and the televisions generally do not want to interrupt the broadcast in order to announce a weather phenomenon.

Another problem identified is the lack of compulsory protocols issued by government decisions concerning establishing online information systems for the population. Alerts by electronic means are practically inexistent, what increases the risk in case of dangerous phenomena.

The complicated forecast scheme used at the moment can be replaced with another much simpler scheme and by use of modern technologies. Instead of meeting in the Prefect's Office, video conferences can be held. By this, it is not necessary that the decision factor from the locality to leave the locality and can maybe, together with persons in charge in the field, implement solutions to avoid calamities. Communication by means of data transfer systems is absolutely necessary in the era of speed, especially if a major risk is forecasted for a certain community.

On a different note, decentralization of decisions and allocation of more rights and freedoms to the Regional Weather Centers represent another potential solution to limit the alert time. Preparing of alerts could follow the scheme within the air traffic meteorology used by almost ten years in air traffic with good and very good results. Carrying out researches and marking on a map of interest area from severe phenomena point of view is another solution in order to reduce alert time. If areas are known as potentially dangerous areas, an early information can be issued so the authorities are informed concerning a potential hazard and have time to take measures to reduce the damages.

Finally, for the third problem, the reluctance to issue severe alerts and codes, it is recommended to analyze the phenomena by using both methods. After some practical experiences is to see that the issuance of a more severe alert leads to more thorough preparing so material damage and especially loss of human life can be prevented.

For the above problems, from the point of view of an efficient communication it is necessary to issue two alerts. One alert, prepared by using special terms is necessary for the authorities specialized in related fields and institutional and private partners as well. A second alert has to be sent to the population. This second alert has to be prepared in a common language with general vocabulary only, without alteration of the sense of the words. The population has to understand the risks that will appear and that they have to seek cover. This proposal is not very hard to implement, given that meteorologists can prepare and issue two alerts. Thus, the population has more time for possible preparations in case of dangerous phenomena.

The second problem that has been emphasized is the problem of the alert systems. We are in the speed age, internet age and yet, we do not have functional apps in the field of weather alerts. The RO-Alert system, commissioned after the events in Timişoara from September 17th, 2017 is functioning most of the time, but unfortunately it is not optimized for selective and automatic alert of the population. In the Emergency Response Department, there is a group working of re-transmission of alerts through the Ro-Alert system. But the problem persists because this system is working only with internet connection. A suggestion to overcome this problem is the announcement by SMS of the population and by radio broadcast methods.

Thus, the alert system used by the National Weather Service in the United States can be taken over. In case of imminent dangerous phenomena, all broadcasting is interrupted both on television and radio by a tone for 15 seconds. After that, a siren is heard and the automatic message is broadcasted. This message includes the forecasted phenomenon in a common language and is simple and short. Furthermore, instructions are broadcasted concerning protection actions. In the United States, this system had unexpected results, so the death toll of tornados decreasing by almost 40%. The implementation of this system requires major investments but these will be amortized in time. Another system that can be relatively easy implemented having an already functioning infrastructure is the alert system by military alarms. It is well known that the alarm exercises are carried out each first Wednesday of each month and are broadcasted by loudspeakers installed in special places, with different tones. The message mentioned above in the previous suggestion can be implemented into that system. From this point of view, the expenses would be much lower with similar results.

The lack cooperation protocols for calamity prevention can be solved by obligating commercial television stations to include in their program talk-shows, documentaries etc. on natural calamities at prime time. This suggestion is viable, but certain broadcasting rules have to be set out in order to inform correctly the population and so they not fall into the trap of „fake news".

Implementation of the above methods can significantly increase the receptivity of the population toward measures that have to be taken in order to protect goods and life in care of dangerous weather phenomena. These methods are already applied on experimental level in some systems in the air traffic with promising results.

4. Conclusions

I tried to underline the utility of radar information in the management of imminent dangerous weather phenomena by presenting specific cases. In this sense, I focused on mid-scale convective systems. These influence a larger area and generally are accompanied by a wide range of weather phenomena with destruction potential. Even if they are not organized in mid-scale level, convective storms can produce individually by a single phenomenon significant damage (for instance hail in agriculture, storms and strong winds or fast floods in power supply, transportation, agriculture etc.) and in extreme cases even loss of human life. I showed such cases also, more or less singular concerning manifestation of weather phenomena.

From communication point of view, a first step has to be taken in creating an easier way to transmit weather forecasts to the population is the issuance of weather alerts (yellow code, orange code and red code) through a single central alert system connected to the majority of information methods. Further, the alert has to be in two versions; one version in specialized language for authorities and state security and meteorology personnel only. The second alert has to be prepared in a common language, which is simple to understand. This second alert has to be broadcasted through media communication channels, mobile phone apps and SMS.

Introduction of a similar system to the United States, where television and radio broadcast is interrupted and an alert is broadcasted in a common language accompanied by recommendations, is recommendable and relatively easy to implement.

The RO-Alert system has to be optimized in order to be able to send alerts not only via internet but by SMS also. Alarms in cities used for alarms in war cases must be equipped with a voice transmission system for alerts for imminent dangerous weather phenomena.

Further, the implementation of a simplified forecast scheme by de-centralization of the forecast systems, introduction of interest areas concerning appearance of dangerous weather phenomena and issuance of alerts oriented to extreme situations can increase the success rate of forecasts.

5. References

1. Chiciudean, I., & David, G. 2011, *Managementul comunicării in situaţii de criză - note de curs*. Bucureşti: Şcoala Naţională de Studii Politice si Administraţie.
2. Mărăzan, V., 2017, *Radarul meteorologic - Principii de funcţionare - note de curs*. Timişoara.
3. Mărăzan, V., 2018, *The management of severe meteorological events*. Timişoara, Eurostampa.
4. Mircov, V., D., Okros. A., Cozma, A., Nicolin, A., & Mărăzan, V., 2018, C*onsideration regarding instability indices of the Aladin model and radar structures associated under the framework of convective situations in Western Romania during the interval 2005-2009*, in *Proceedings of the 18th International Multidisciplinary Scientific GeoConference (SGEM 2018)*, 18 (4.2.), 395-402. doi:10.5593/sgem2018/4.2/S19.052
5. Suciu, L., 2014, *În căutarea sensului. De la analiza discursului la design-ul comunicațional,* Timișoara, Orizonturi Universitare.
6. Suciu, L., Kilyeni, A., *Ghid de comunicare sctisă și orală,* Casa Cărții de Știință.
7. www.meteoromania.ro (accessed on 5th of June 2019).