Brief Introduction of the Work of Receiving and Reporting Natural Disaster Information

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Abstract

In China, natural disasters are characterized by wide distribution, high frequency of occurrence, and serious loss of human and property. What we need to face is not only earthquakes, but also various natural disasters including mudslides, landslides, floods and other disasters. This situation requires us to change from a single-hazard response model to a multi-hazard response model. It also requires us not only to pay attention to the situation after the disaster, but also to pay attention to the entire situation before, during and after the disaster.

As a staff of natural disaster information collection and reporting, we are constantly learning, exploring, and optimizing our information receiving and reporting workflow. Based on knowledge of multiple disciplines (remote sensing, geoinformatics, computer science, mathematical modeling theory, etc.), a comprehensive disaster information database, and a variety of display platforms, we effectively respond to a variety of natural disasters in an orderly and effective manner. With the help of my actual work experience, this paper provides detailed information on the collection and submission of information after the occurrence of natural disasters (mainly earthquakes) in daily work. Mainly include: under what circumstances to carry out emergency response; how to start information response procedures; start the process of information emergency response; how to produce different products according to different disaster events; how to provide further products according to the development of disaster events; how to target different Disasters collect different information; how to quickly and accurately release products; how to further improve the diversification and visualization of information products; and a little knowledge and perception of natural disaster emergency work in daily work.

Keywords: natural disaster information, receiving and reporting working, management system and mold;

Introduction

China is a country with frequent and severe natural disasters. Every year, some areas suffer from various natural disasters, such as earthquakes, droughts, floods, and biohazard. Some areas along the coast of China are prone to natural disasters such as typhoons, storm surges, heavy rains, floods, droughts, saline intrusion, and earthquakes.In some cities along the river in my country, natural disasters such as heavy rains, droughts, water loss and soil erosion, landslides, and debris flow frequently.In areas with a lot of mountains in our country, natural disasters such as earthquakes, mudslides, landslides and hail are extremely prone to occur. Generally speaking, the characteristics of natural disasters in my country are: many types, high frequency, wide distribution range, and large regional differences[1].

Some foreign countries have relatively complete information receiving departments, reporting systems and information platforms. During the Wenchuan earthquake in Sichuan, 2008, China, Russia's efficient working mode for China has left a deep impression on Chinese people[2]. The Russia's emergency ministry has developed a very unique monitoring system for 24-hour prevention and monitoring. The operation mode is characterized by the daily and night monitoring and forecast, and the analysis of the data information obtained, so that the whole country is under the security system of security.

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The United States is also a country with high incidence of natural disasters. The United States has a three-level natural disaster emergency management system, which advocates the participation of professional teams and all citizens. It is worth mentioning that the United States has an emergency response plan system with SMS as the sending channel, which can send early warning messages to the public in the event of terrorist attacks or serious natural disasters. After the occurrence of natural disasters, the website of FEMA and some non-governmental organizations will release and update the latest disaster information and rescue information in real time[3]. In addition, many countries have their own unique information receiving and reporting systems and working mold, which are not described in detail in this paper.

As the largest developing country, China is facing more and more severe challenges. On March 17, 2018, the Chinese government established Ministry of Emergency Management of the People's Republic of China, which is of epoch-making significance for disaster management in China. The establishment of the Ministry of Emergency Management of the People's Republic of China has solved the working state of different types of natural disasters managed by different departments from the highest level of government, making it possible for comprehensive disaster management, which is an important measure to reorganize the disaster management system and integrate the responsibilities of disaster management departments. In this era, as an emergency worker, we need to change our concept quickly, from the previous single natural disaster response mode to a variety of natural disaster response mode. Before 2018, the disaster response mode of many natural disaster management departments occurred after the disaster. Nowadays, under the organization of the Ministry of Emergency Management of the People's Republic of China, the relevant departments of local emergency management will arrive at the place to guide and prevent the disaster. Once the disaster occurs, it will immediately carry out the rescue and relief work, and in the later, it will set up a working group to coordinate the relief materials and funds. This way of working can be familiar with the regional situation in advance, and minimize the loss caused by disasters. This requires us to change our concept, from focusing only on the post disaster situation to focusing on the whole process before, during and after the disaster.

National Earthquake Response Support Service (NERSS) is a public institution directly under the Ministry of Emergency Management of the People's Republic of China, which has the first China International Search and Rescue Team. NERSS undertakes the research and development of earthquake emergency rescue technology, information service, equipment support, personnel training and other tasks at home and abroad. It is the national business leader and technical guidance unit in the field of earthquake emergency rescue. This paper mainly has a brief introduction of the Work of receiving and reporting natural disaster information in NERSS (take earthquake disaster as an example).

Receiving and Reporting of Natural Disasters

(1) The Domestic Receiving and Reporting of Natural Disasters

There are certain initiation and response standards for the information submission of natural disasters in China, and different emergency departments have different initiation standards. Taking the response to earthquake disasters in my work as an example, generally speaking, when an earthquake with m $\geqslant$ 4.0 occurs in the eastern part of China's mainland and an earthquake of M $\geqslant$ 4.5 in the west, the information staff starts the response work.

After the start-up, the information staff on duty need to do: First, report the earthquake information to the superior leaders on duty, and the leaders on duty put forward emergency response suggestions to the on duty personnel. Second, the information staff on duty immediately starts the rapid assessment of the disaster situation, and reports the assessment results through emergency business system website, and sends it to the relevant personnel through various ways (Wechat group, Email and so on). Thirdly, the information staff on duty and his/her partners should quickly collect the disaster, social and public opinion information, and send the collected results to the relevant personnel through various ways (Wechat group, Email and so on). Fourth, summarize the collected disaster information, and prepare the disaster information bulletin, which will be reported through the emergency business

system website after being reviewed by the superior leaders. Fifth, cooperate with other departments to support information work.

Information staff need to produce different information briefing for different disaster events. When an earthquake of magnitude 4.0 to 5.0 occurs in a slightly densely populated area, we temporarily judge it as a general earthquake disaster. For the general level earthquake, the brief report of disaster information submission mainly focuses on the rapid assessment of casualties. When earthquakes occur in areas where earthquakes do not occur frequently, or when earthquakes of general magnitude occur in relatively sensitive areas, the information staff on duty should focus on public opinion information on the Internet. When the earthquake of M s 5.0 to 6.0 occurs in the slightly densely populated areas, and the earthquakes with m s 4.0 and m s 5.0 occur in the densely populated areas, they are initially judged as slightly major earthquake disasters. The contents of information submission for slightly major earthquake disasters include rapid assessment of casualties, affecting field of earthquake damage, villages situation near earthquake, and geological hazard risk assessment. When an earthquake of magnitude 6.0 to 7.0 occurs in a slightly densely populated area, or an earthquake of magnitude 5.0 to 6.0 occurs in a densely populated area, we preliminarily judge it as a major earthquake disaster. The contents of major earthquake disaster information submission include rapid assessment of casualties, affecting field of earthquake damage, distance between township and epicenter in the earthquake area, risk assessment of geological disasters, distance between major projects (Chemical Industry Park, reservoir dam, high-speed railway, bridge, oil and gas pipeline, etc.) and epicenter, combined with real-time population thermal data and online basic geographic data, to determine key rescue areas and rescue targets. When an earthquake with m $\geqslant$ 7.0 occurs in a slightly densely populated area or an earthquake with m $\geqslant$ 6.0 occurs in a densely populated area, it is initially judged as a particularly serious earthquake disaster. In addition to the contents mentioned above, the rescue force should also be considered into the contents of particularly serious earthquake disaster.

After starting the earthquake response, the information staff on duty should carry out the response work as fast as possible, and produce the first briefing within 15 minutes after the earthquake. This briefing includes the three elements of the earthquake, the population and economy of the earthquake area, the altitude of the earthquake area, historical earthquakes, the results of rapid assessment including the prediction of population casualties, emergency response suggestions and preliminary site conditions (if any). In the case of certain impact on the earthquake site and on-site action, a second briefing will be produced within 1 hour after the earthquake to report the information about the disaster situation on the site. This information may be obtained through social media, telephone inquiries, and other means. Then, according to the response and emergency situation of the disaster, the follow-up briefing will continue to be produced at an interval of 3 hours until the superior department leader announces the end of the response.

According to the different types of natural disasters, the information staff on duty focus on and collect different information sources. For example, in an area where a particularly serious earthquake disaster has occurred, after an earthquake of general magnitude, the information staff on duty needs to focus on collecting the local public opinion guidance under the condition that there will be no loss of personnel and property in the area. In the later stage, a special briefing on public opinion can be produced. In view of the natural disasters such as landslides, information workers need to pay attention to the weather, precipitation, geological conditions of rock strata and other related professional information. In view of different natural disasters, different information response mechanisms should be established, so as to achieve the goal of being calm and targeted.

Taking our information response team responding to earthquake disaster as an example, the information duty officer establishes a quick contact mechanism with the information audit leader and the leader in charge of the shift. Once the earthquake reaches the corresponding level, the leader in charge of the shift will announce the start-up response, and the audit leader and the information staff need to reply immediately. The establishment of a quick response mechanism between the information staff and the leaders can quickly produce the first briefing, which can be sent out quickly by various means after being revised and signed by the audit leader and the leader in charge. In just 15 minutes, the information staff will try to enrich the content of the first briefing, including the map.

(2) **The International Receiving and Reporting of Natural Disasters**

It should be emphasized that NERSS is the only institution in China that monitors and evaluates international natural disasters day and night. Taking earthquake disaster as an example, under normal circumstances, the work of receiving and reporting information will be started immediately after an earthquake of magnitude 6.0 or above occurs on land and 7.0 in sea area outside China. The process of information response program initiated by information staff is roughly consistent with that of earthquake response in China. It should be emphasized that after the occurrence of severe natural disasters in the world, the information staff on duty should pay attention to the VO section of GEDAS website, the status of international rescue teams in various countries, and whether the affected countries need the support and help of international rescue teams.

Management System and Mode

In order to do a good job in information submission at home and abroad, our information staff on duty have academic background in relevant knowledge fields, including disaster science, geology, geographic information system, remote sensing and other disciplines. In addition, the information staff have high academic level, almost all of them have master's or doctor's degrees. It is worth mentioning that our staff are conscientious and can be prepared to respond to emergencies 24 hours a day for 7 consecutive days.

Through their own duty experience, new and old information staff develop their own property rights of duty system platform to help them better respond to natural disaster information. Taking the earthquake disaster as an example, the system platform can automatically read the earthquake short message, judge whether it reaches the response level and send the signal to the information staff on duty immediately. In addition, the system can automatically output the primary briefing according to the database information, and the output time is at the minute level, which greatly shortens the time for the staff on duty to write the briefing. Finally, the system has the mode of multi person collaborative modification, which can edit the same briefing by many people, which greatly improves the efficiency.

Fast and accurate information receiving and reporting work can not lack the support of soft power. We have a sound database and efficient computational evaluation model, map output module. Every year, we invest a lot of talents and energy to do scientific research in this field, including model optimization, database upgrade and software upgrade. Strive to efficiently and quickly carry out the work of receiving and submitting information.

Conclusion

As an ordinary information receiving and reporting staff, I feel infinite honor and pride, I hope to do my own work as well as possible. Furthermore, we think about how to continue to improve the intelligence and accuracy of the on duty system. In addition, we will further improve the diversification and visual operation of information products to produce more diversified information products and assist more departments and individuals.

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