Mar 26, 2020

The Cluster Feature of Coalmine Disasters and Earthquakes in China

Chen Bo[1]

[1]School of Earth and Space Sciences, Peking University, Beijing 100871, China

1 Works for me dx.doi.org/10.17504/protocols.io.bd89i9z6

Chen Bo

ABSTRACT

Recently, in China, nearly half of coalmine disasters are found to present cluster feature or to be accompanied with earthquakes (<5) nearby, in which all the disaster types are involved. Of all the causative factors, stress disturbance, the only one that can cause all kinds of coalmine disasters at one time, seems to exist among mining areas and to be responsible for the cluster feature. In further research, more coalmine disasters are found accompanied with micro-earthquakes, which may become the vital geophysical evidence of the tectonic stress fluctuation around mining areas. This paper lists and analyzes all the possible causative factors to demonstrate the authenticity and reliability of the new phenomena and ultimately, all the other known causative factors have been speculated and excluded. A quantitative research has been made on the cluster degree, by which the space-time distribution curves are achieved. The readers can query the ratio of disasters involved in cluster series and the number of coalmine disasters accompanied with earthquakes. For example, under the threshold of **10**0 kilometers, 47 % of disasters are involved in cluster series and 372 coalmine disasters are accompanied with earthquakes. The readers can also query the detailed distribution of the durations. Potentially, the duration of cluster series reflects that of stress disturbance. The majority cluster series lasted for 1~2 days, which are more likely related to local stress disturbance. While the minority lasting longer than 4 days correspond well with fatal earthquakes, which are speculated to be related to regional stress disturbance. In addition, all the cluster series under every threshold have been picked out successfully and a full open access is provided. The cluster series possess multiple properties, such as the area, the related disasters, etc., which compared with the energy and the magnitude of earthquakes, good correspondences are acquired. It indicates that the cluster series of coalmine disasters and earthquakes are linked with fatal earthquakes and may serve as footprints of stress disturbance. The paper is not anxious to set up or to prove a theory, but to makes the most common speculations on a given geological model, in which five affecting cases are analyzed. To earthquake research and disaster prevention, widely scientific significance is suggested.

EXTERNAL LINK

http://pan.baidu.com/s/1sjnCEh3

THIS PROTOCOL ACCOMPANIES THE FOLLOWING PUBLICATION

http://www.earthsciencefrontiers.net.cn/CN/article/downloadArticleFile.do?attachType=PDF&id=5180

ATTACHMENTS

Supplementary information I(EMF).doc

Supplementary information II□by threshold 40□.pptx

The Cluster Samples□include micro earthquakes□.rar

The Cluster Samples□magnitude higher than 3□.rar

Citation: Chen Bo (03/26/2020). The Cluster Feature of Coalmine Disasters and Earthquakes in China. https://dx.doi.org/10.17504/protocols.io.bd89i9z6