

Interactive comment on “Global warming causes sinkhole collapse – Case study in Florida, USA” by Yan Meng and Long Jia

Y. Meng

sinkhole@163.com

Received and published: 8 March 2018

We are very grateful to the reviewers for their questions and suggestions on this article. As the experts put it, studying the relationship between global climate change and geological disasters is a global system science that requires multiple scholars to study from different perspectives. First, we carefully studied the articles provided by the experts. Thornbush MJ (2017) Part 2: Spatial-Temporal Occurrences of Sinkholes as a Complex Geohazard in Florida, USA. *J Geol Geophys* 6:286. doi: 10.4172/2381-8719.1000286 We are very interested in the content of the article, and the results of the article also prove the effect of temperature change on karst collapse. “The paper from this case study reveal a high incidence of sinkhole occurrence when temperatures are low and precipitation is also low in winter months

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(especially January). This suggests that temperature (rather than precipitation) may be the principal driving climatic factor, along with associated human impacts.” We know that the formation of karst collapse is a complex process from dissolving limestone to surface pits. We cannot deny that the ultimate collapse of the ground surface may be triggered by many factors such as human activities and earthquakes, However, during the formation of karst collapse, especially before the triggering of human activities, what are the factors at work should be the problem that we need to seriously study, which is also one of the research purposes of this article. Only Florida USA was chosen as a research example because of the good research base and database in this area. We revised the essay based on the opinions of experts and answered the specific questions as follows: 1. We have carefully studied the articles provided by experts. We are also very interested in the content of this article. The results of the article also seem to prove the impact and effect of temperature changes on karst collapse. We hope to have the opportunity to discuss with the author. 2. The data used in the article are based on official data from the USGS and publicly available data from the Institute of Florida sinkhole, not just data from insurance companies, which should be reliable. Even though these collapse data cannot contain all of Florida, the number of samples used and the macroscopic regularities of the responses can also support the viewpoint of this article from the perspective of mathematical statistics and scientific research. 3. There are indeed three peaks in Figure 2, the first peak period (1963-1976), the second peak period (1980-1993) and the third peak period (1994-2007). Since the amplitude of the first peak period is lower than the Second and third, so often overlooked. Some statistical methods proposed by experts to prove these peaks are unique. This is a good suggestion. We will conduct this research in future work. 4. We have added relevant references, on the third page 5,6,7. We adjusted the article structure according to the expert opinion, and explained the drought coefficient. 8,9. Global warming will lead to extreme climate changes such as droughts, torrential rains and frosts. It is also an important trigger factor for the collapse of human activities. The purpose of this paper is to analyze the relationship

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between global warming and karst collapse from a macro perspective, In the event of climatic anomalies, especially in the event of drought, the monitoring and prevention of karst collapse should be stepped up. The problem of collapse caused by other factors such as pumping in some areas and engineering construction should not be negated. Groundwater change is an important trigger for the formation of karst collapse. However, this paper mainly discusses the relationship between global climate change and collapse. Therefore, no water level analysis is conducted and the author cannot obtain relevant data. 11. According to the expert opinion, the article has been modified.

Please also note the supplement to this comment:

<https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2018-18/nhess-2018-18-SC1-supplement.pdf>

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2018-18>, 2018.