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Statistical Interpretation of Natural and Technological Hazards in China

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China is prone to catastrophic natural hazards from floods, droughts, earthquakes, storms, cyclones, landslides, epidemics, extreme temperatures, forest fires, avalanches, and even tsunami. This paper will list statistics related to the six worst natural disasters in China over the past 100 or so years, ranked according to number of fatalities. The corresponding data for the six worst natural disasters in China over the past decade will also be considered. [The data are abstracted from the International Disaster Database, Centre for Research on the Epidemiology of Disasters (CRED), Université Catholique de Louvain, Brussels, Belgium, http://www.cred.be/ where a disaster is defined as occurring if one of the following criteria is fulfilled: 10 or more people reported killed; 100 or more people reported affected; a call for international assistance; or declaration of a state of emergency.] The statistics include the number of occurrences of each type of natural disaster, the number of deaths, the number of people affected, and the cost in billions of US dollars. Over the past hundred years, the largest disasters may be related to the overabundance or scarcity of water, and to earthquake damage. However, there has been a substantial relative reduction in fatalities due to water related disasters over the past decade, even though the overall numbers of people affected remain huge, as does the economic damage. This change is largely due to the efforts put in by China's water authorities to establish effective early warning systems, the construction of engineering countermeasures for flood protection, the implementation of water pricing and other measures for reducing excessive consumption during times of drought. It should be noted that the dreadful death toll due to the Sichuan Earthquake dominates recent data.

Joint research has been undertaken between the Department of Environmental Engineering at Peking University and the Department of Engineering Science at Oxford University on the production of zonation maps of certain natural hazards in China. Data at city and county level have been interpreted using a hierarchical system of indices, which are then ranked according to severity. Zonation maps will be presented for debris flows, landslide and rockfall hazards, flood risk in mainland China, and for soil erosion processes in the Yellow River basin. The worst debris flow hazards are to be found in southwest China as the land begins to become mountainous. Just over 20% of the land area is at high or very high risk of landslide and rockfall hazards, especially Yunnan, Sichuan, Gansu and Shannxi provinces. Flood risk is concentrated towards the eastern part of China, where the major rivers meet the sea.

The paper will also consider data on technological disasters in China from 1900 to 2010, using data supplied by CRED. In terms of fatalities, industrial accidents appear to be dominated by explosion events. However, gas leaks have affected the largest number of people. Transport accidents are ranked in terms of fatalities as follows: water - road - rail - air. Fire is a major cause of loss of life, whereas chemical spills and poisoning seem to lead to fewer deaths.