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## Locust infestation in China in 1358-1911 and its relation with changes in East Asian monsoon climate

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Locust infestation has been a serious threat to agriculture and its occurrence of locust infestation is closely related to the climate condition, especially drought. Because agriculture was the main economic activity of China in historical time, damages on agricultural produce due to locust infestation had been recorded continuously in national chronicles for more than 2000 year. In this study, we will utilize the locust infestation records in Chinese historical documents in 1358-1911 to form temporal and spatial series, perform statistical analyses and infer possible changes in East Asian monsoon climate during this period.

We will utilize the digitized meteorological record database in China, called REACHES (Reconstructed East Asian Climate Historical Encoded Series. See Wang et al., 2018, *Nature: Scientific Data*, 5, 180288), to extract locust records in 1358-1911 corresponding to Ming and Qing dynasties of China to perform analysis. In a previous study (Lin et al., 2020) we had shown that the locust infestation is closely related to the general drought condition in Qing dynasty (1644-1911). In the present study we expand the total period length to include Ming dynasty. We will perform time series analysis as well as spatial analysis to understand the relation of locust infestation and other climate variables.

Previous studies of locust infestation in East Africa by United Nations show that the movement of locust swarms are closely related to monsoon fronts. Our preliminary analysis shows that this also appears to be the case in the movements of East Asian locusts. Thus it is possible that we can use the locust infestation series to reconstruct past changes in East Asian monsoon climate.