Land management extends the duration of the impact of extreme on vegetation

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Extreme weather events have a severe impact on vegetation and the carbon cycle. It is generally believed that the vegetation will begin to recover immediately after the extremes, slowly or rapidly. This study will initially report a new response mechanism. We investigated a case of an extreme precipitation event that occurred in a double-cropping (DC) systems dominated region located Yangtze-Huai plain in China, where winter crops and summer crops are planted rotationally within one year. Generally October and June are the transitional periods for harvesting and sowing. In October 2016, monthly precipitation showed strong positive anomalies. Strong negative anomalies of EVI (enhanced vegetation index) persisted during March to May 2017, in response to the farmland abundance due to the heavy rain, especially over the farmland with winter crops – summer rice paddy systems. Information on abandonment due to precipitation also has been confirmed in local agro-meteorological monthly reports and some local government announcements. Data from a flux observation station in the region showed that from January to May 2017, NEE dropped significantly compared to the same period in 2016. Our results demonstrate that, in such a double-cropping system, once extreme events occur during the key sowing period and the phenological conditions determine that it cannot be replanted after, the duration of the impact will last through the entire crop growth period until the next sowing. In other word, land management could extend the duration of the impact of extremes on vegetation.