

Narisma, G.T., J.A. Foley, R. Licker, and N. Ramankutty (2007). Abrupt changes in rainfall during the twentieth century. *Geophysical Research Letters* 34, L06710, doi:10.1029/2006GL028628, 2007

Abstract:

Complex interactions in the climate system can give rise to strong positive feedback mechanisms that may lead to sudden climatic changes. The prolonged Sahel drought and the Dust Bowl are examples of 20th century abrupt climatic changes, which had serious effects on ecosystems and societies. Here we analyze global historical rainfall observations to detect regions that have undergone large, sudden decreases in rainfall. Our results show that in the 20th century about 30 regions in the world have experienced such changes. These events are statistically significant at the 99% level, are persistent for at least 10 years, and have an average magnitude of change that is 10% lower than the climatological normal. This analysis indicates the extent and magnitude of abrupt climate changes across the globe during the 20th century and can be used for studying the dynamics of and the mechanisms behind these abrupt changes.