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Title:	Persistent impact of spring floods on crop loss in U.S. Midwest
Authors:	Ojha, Chandrakanta (/jspui/browse?type=author&value=Ojha%2C+Chandrakanta)
Keywords:	SAR Flood map Crop yield Stream gage MODIS NDVI
Issue Date:	2021
Publisher:	Elsevier
Citation:	Weather and Climate Extremes, 34, 100392.
Abstract:	Climate extremes threaten global food security, and compound events, such as late spring heavy and warmer rainfall over snow and subsequent flooding, exacerbate this vulnerability. Despite frequent occurrences in recent years, a quantitative understanding of the compound weather events' impacts remains elusive. Here, we use Synthetic Aperture Radar data from Sentinel-1 and normalized difference vegetation index data from MODIS satellites to map the spring 2019 U.S. Midwest flood extent and evaluate its impact on crop loss. We find a statistically significant association between flooded counties and those with plant greenup delay, while the correlation between flood area percent and amount of green-up delay remains weak, albeit reliable. An analysis of the stream gage time series and crop loss records shows that during the past ~70 years, ~43% of spring large discharges are associated with widespread crop loss. We also find an increase in streams' discharge frequency and magnitude across the Midwest, indicating the possibility of a future increase in crop loss due to spring flooding. This study highlights the importance of Earth-observing satellite data for developing climate adaptation and resilience plans.
Description:	Only IISER Mohali authors are available in the record.
URI:	https://doi.org/10.1016/j.wace.2021.100392 (https://doi.org/10.1016/j.wace.2021.100392) http://hdl.handle.net/123456789/4360 (http://hdl.handle.net/123456789/4360)
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