

# Natural disasters and food security

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University of Sussex

Global Studies

October 25, 2016: EM-DAT Technical Advisory Group Meeting

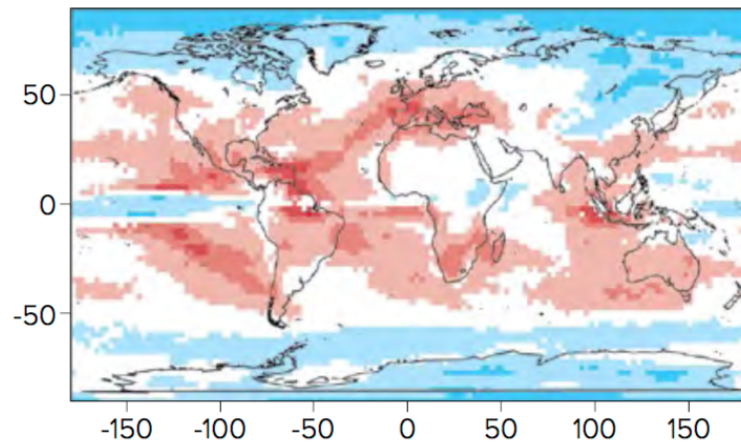


Navin Ramakutty

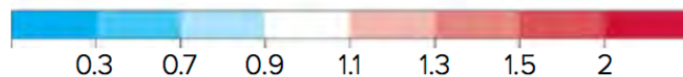


Corey Lesk

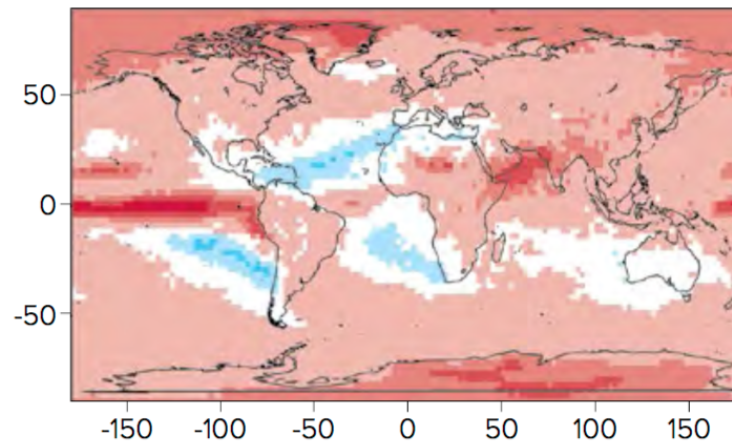
**(a) 'Drought'**



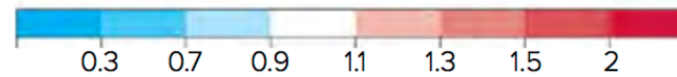
2080–2099 mean relative to 1986–2005 mean



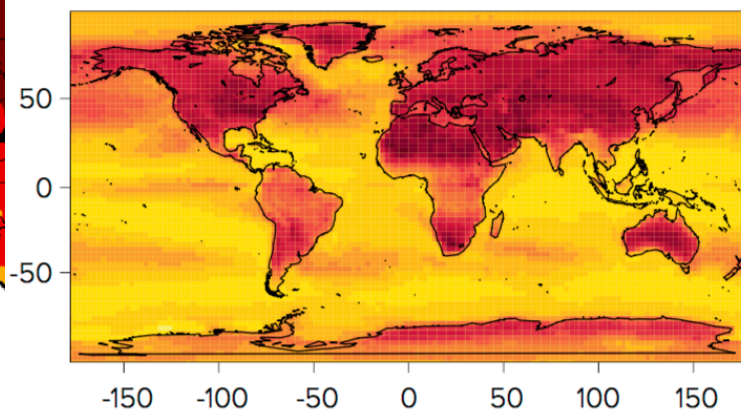
**(b) 'Flood'**



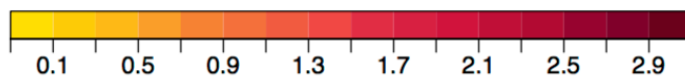
2080–2099 mean relative to 1986–2005 mean



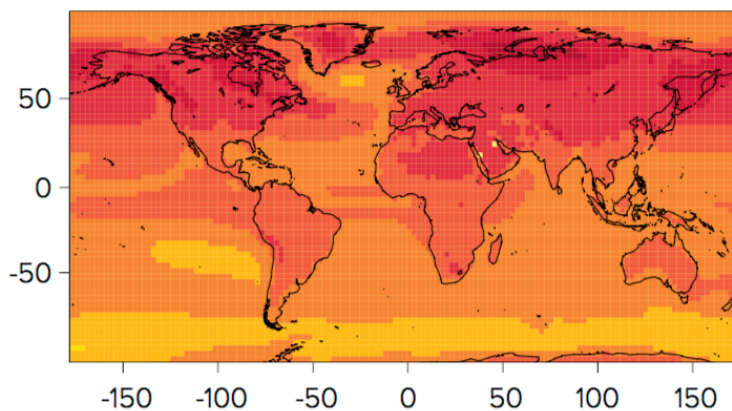
**(c) 'Heatwave'**



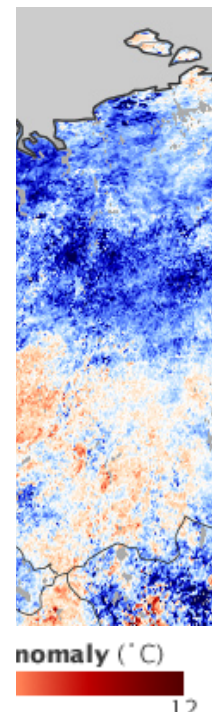
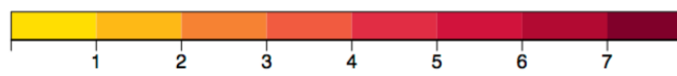
2080–2099 mean relative to 1986–2005 mean



**(d) Wet bulb globe temperature**



2080–2099 mean relative to 1986–2005 mean





# EM-DAT

## The International Disaster Database

Centre for Research on the Epidemiology of Disasters - CRED



year	dis_subgroup	dis_type	dis_subtype	country_name	start_year	start_month	start_day	end_year	end_month
1961	Hydrological	Mass movement wet	Landslide	Soviet Union	1961	3	13	1961	3
1961	Hydrological	Flood	--	Japan	1961	6	0	1961	6
1961	Hydrological	Flood	--	India	1961	7	0	1961	7
1961	Hydrological	Flood	--	India	1961	9	6	1961	9
1961	Hydrological	Flood	--	India	1961	10	9	1961	10
1961	Hydrological	Flood	--	Hong Kong (China)	1961	4	24	1961	4
1961	Hydrological	Flood	--	Korea Rep	1961	7	0	1961	7
1961	Hydrological	Flood	--	India	1961	10	0	1961	10
1961	Hydrological	Flood	--	Somalia	1961	11	0	1961	11
1961	Climatological	Extreme temperature	Cold wave	India	1961	12	0	1961	12
1961	Climatological	Drought	Drought	Canada	1961	1	0	1961	0
1962	Hydrological	Flood	Flash flood	Spain	1962	9	27	1962	9
1962	Hydrological	Mass movement wet	Landslide	Peru	1962	3	0	1962	3
1962	Hydrological	Mass movement wet	Landslide	Venezuela	1962	5	0	1962	5
1962	Climatological	Extreme temperature	Heat wave	Mexico	1962	5	0	1962	5
1962	Hydrological	Flood	--	Japan	1962	7	0	1962	7
1962	Hydrological	Flood	--	Colombia	1962	8	0	1962	8
1962	Hydrological	Flood	--	India	1962	8	0	1962	8
1962	Hydrological	Flood	--	Korea Rep	1962	8	0	1962	8
1962	Hydrological	Flood	--	India	1962	9	0	1962	9
1962	Hydrological	Flood	--	Haiti	1962	11	0	1962	11
1962	Hydrological	Flood	--	Tunisia	1962	11	0	1962	11
1963	Hydrological	Mass movement wet	Landslide	Korea Rep	1963	6	24	1963	6
1963	Hydrological	Mass movement wet	Landslide	Italy	1963	10	9	1963	10



Browse Data **BY DOMAIN** | BY COUNTRY / REGION | RANKINGS

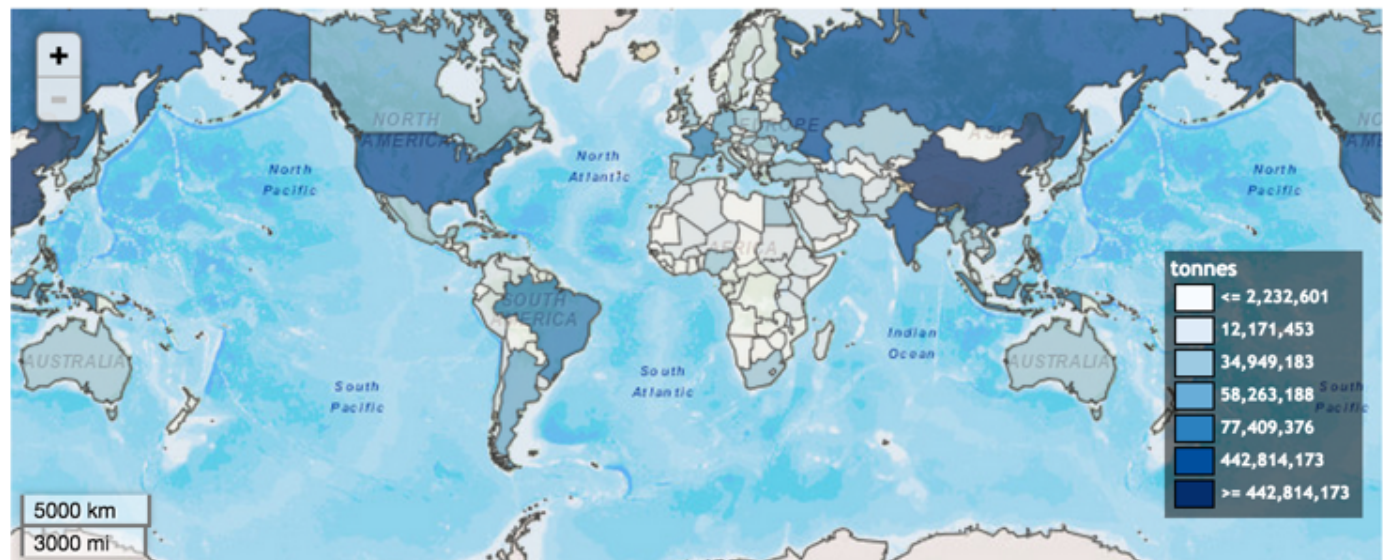
FAOSTAT Domains

- Food Security
- Production**
  - Crops
  - Crops processed
  - Live Animals
  - Livestock Primary
  - Livestock Processed
  - Production Indices
- Trade
- Food Balance
- Prices
- Inputs
- Population
- Investment
- Agri-Environmental Indicators
- Emissions - Agriculture
- Emissions - Land Use
- Forestry
- ASTI R&D Indicators
- Emergency Response

Production

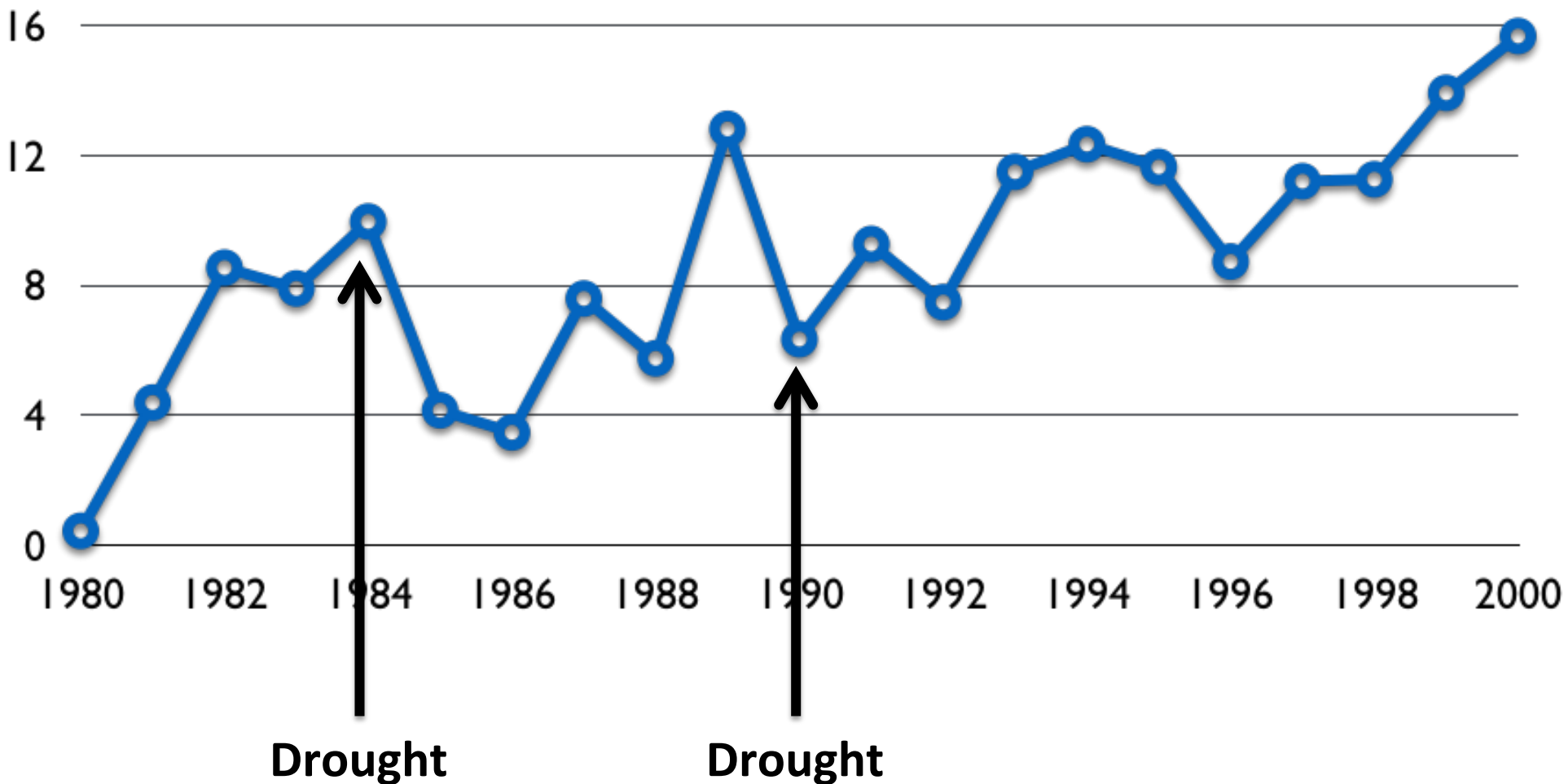
ITEM: Cereals,Total FROM YEAR: 1992 TO YEAR: 2012 AGGREGATION: Average

Production quantities by country Average 1992 - 2012

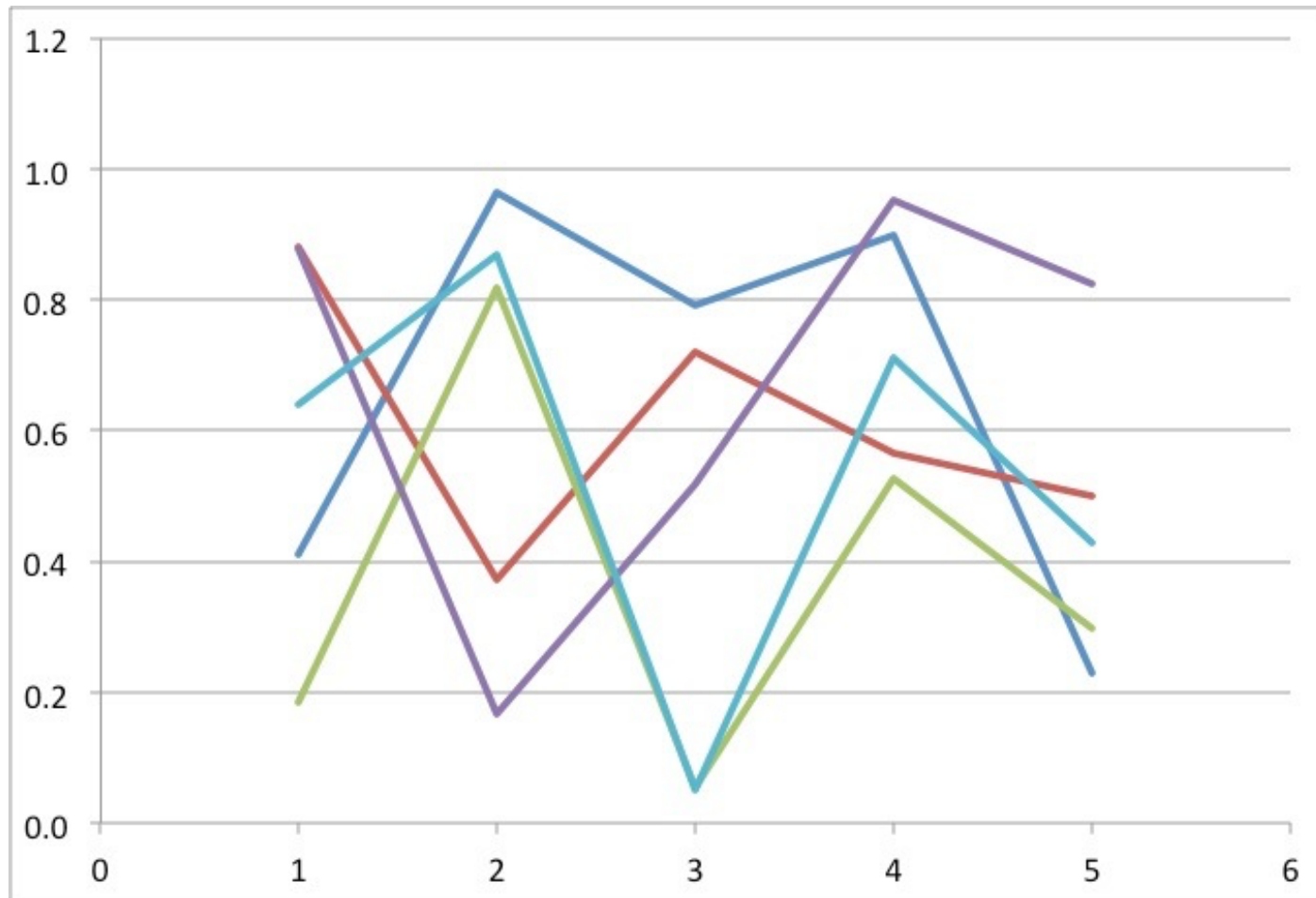


The designations employed and the presentation of material in the map do not imply the expression of any opinion whatsoever on the part of

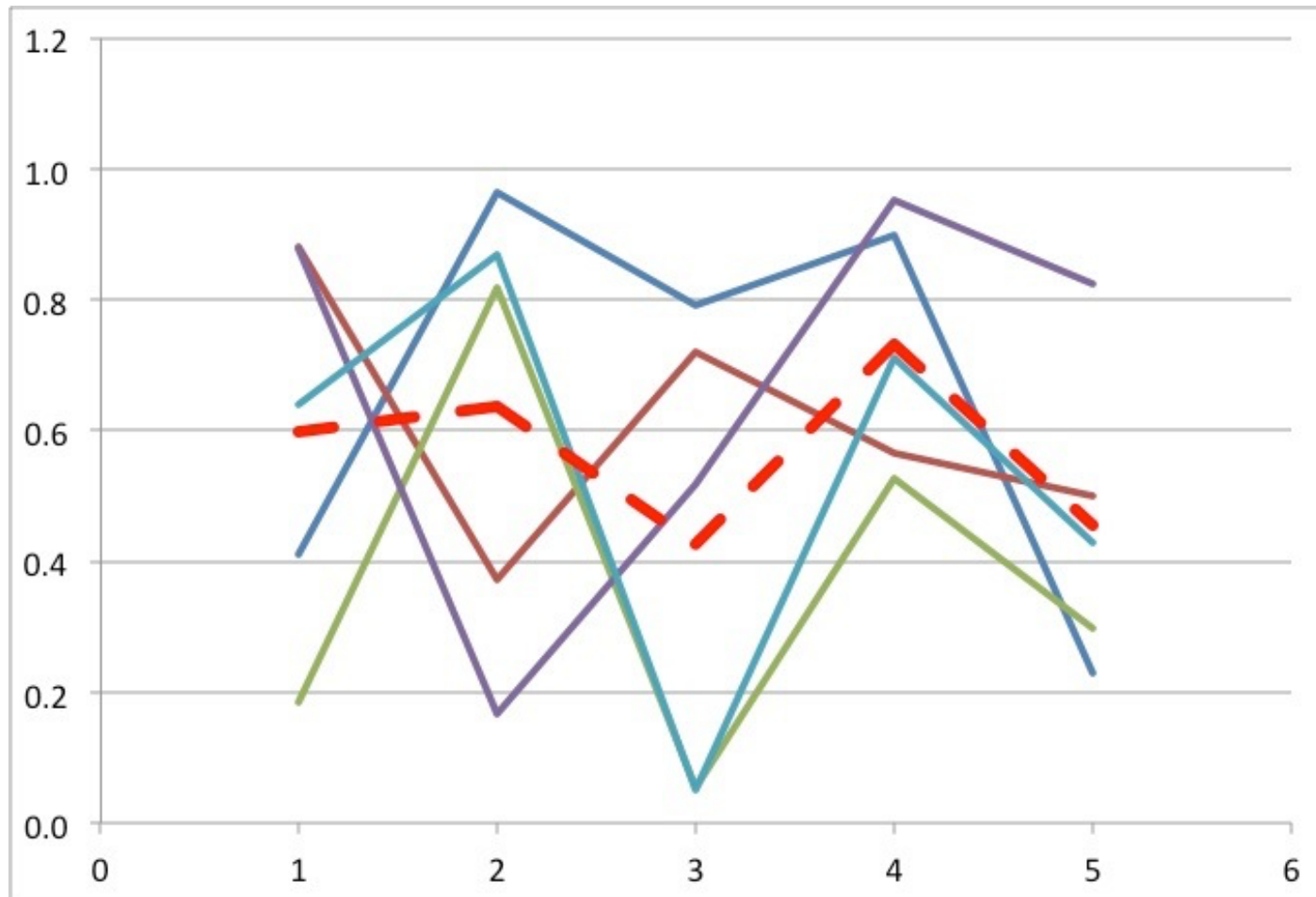
Can we 'see' the influence of disasters  
in time-series of agricultural data?



# Method: Superposed Epoch Analysis

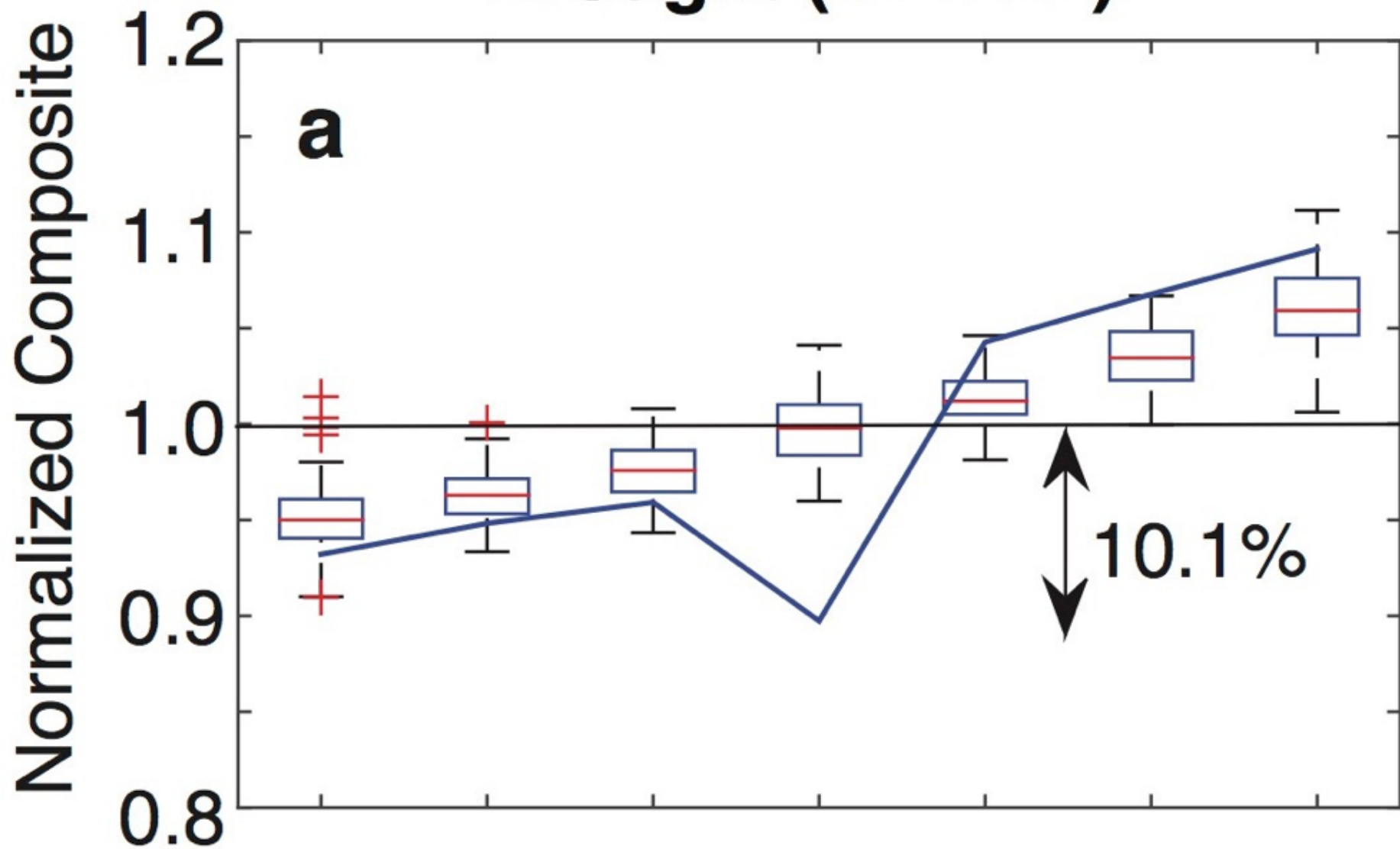


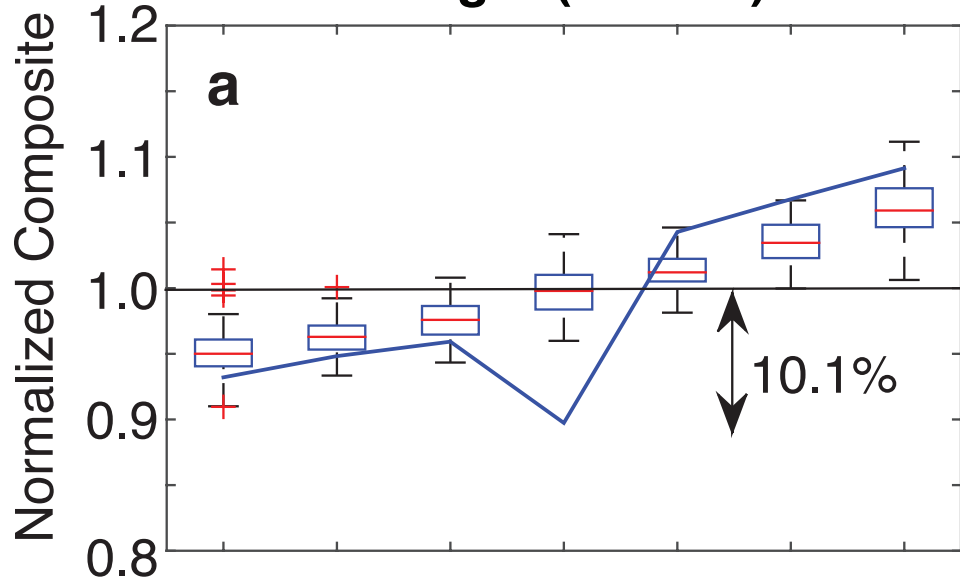
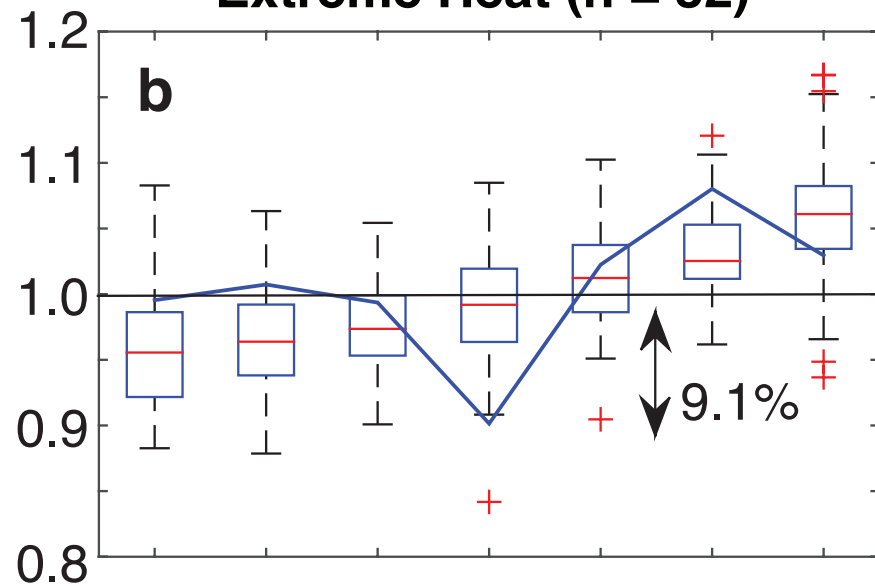
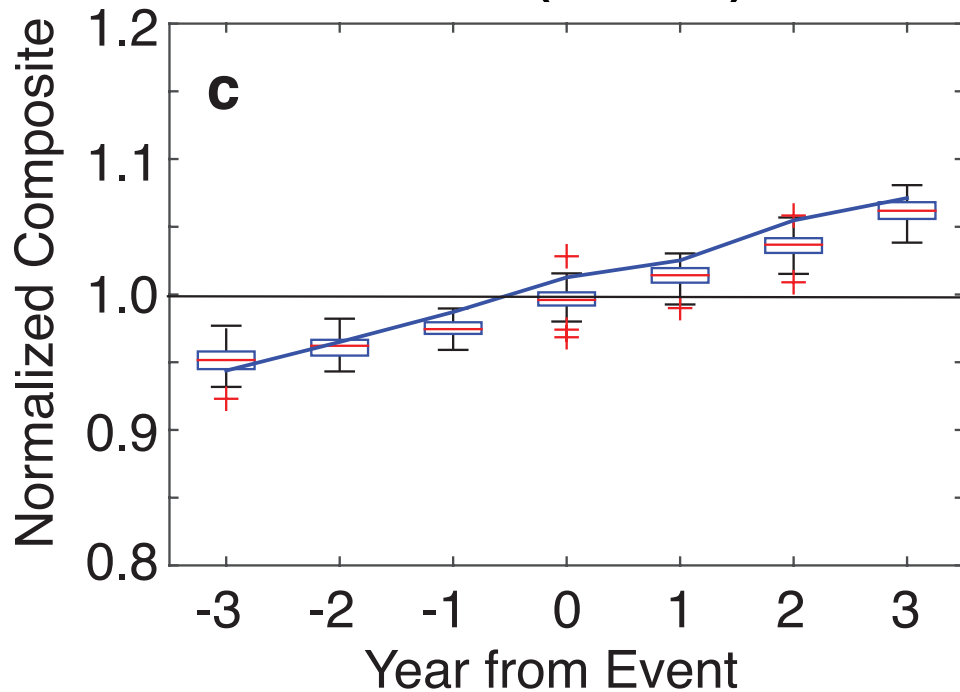
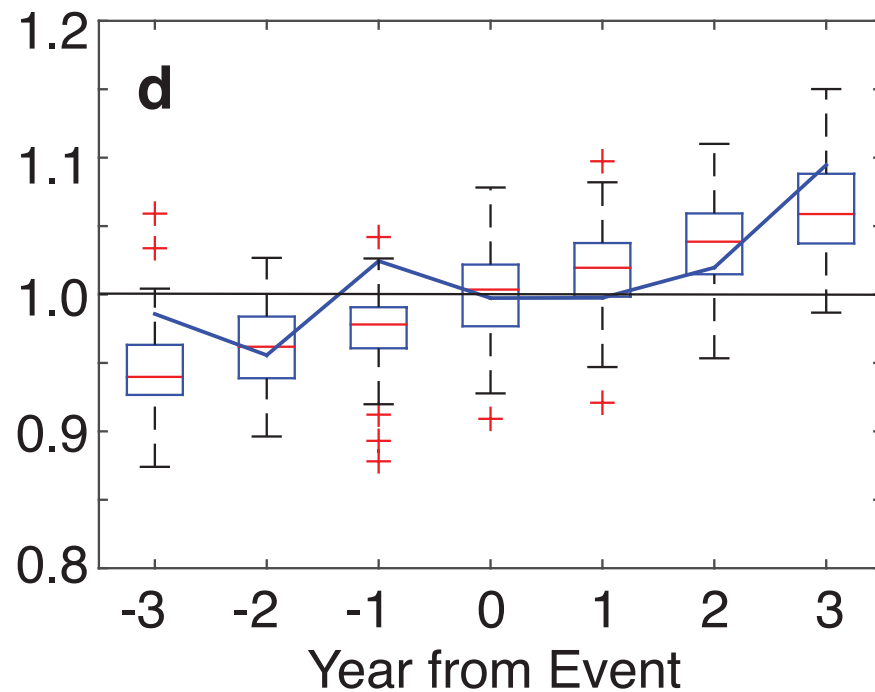
# Method: Superposed Epoch Analysis



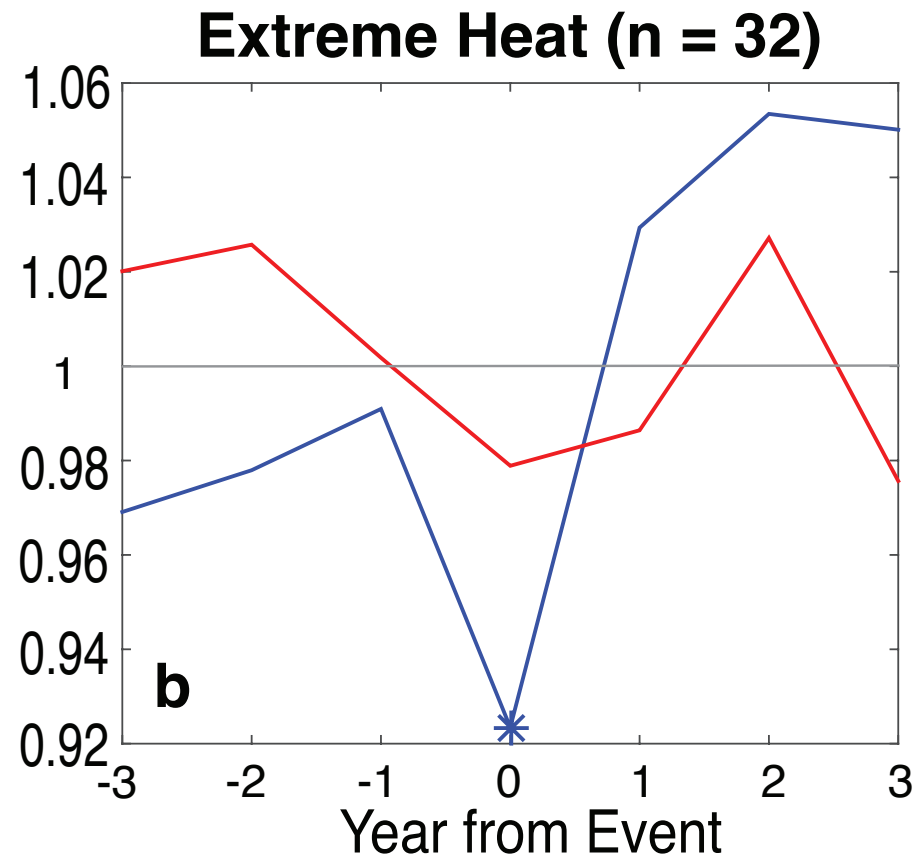
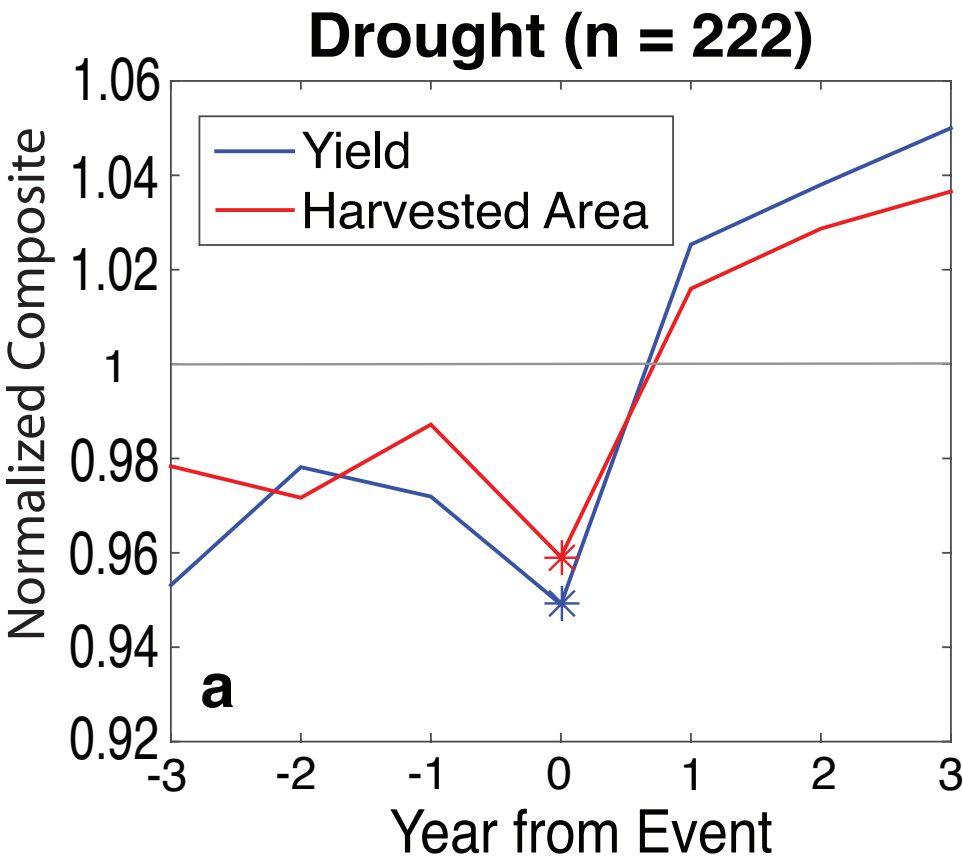


# Drought (n = 222)

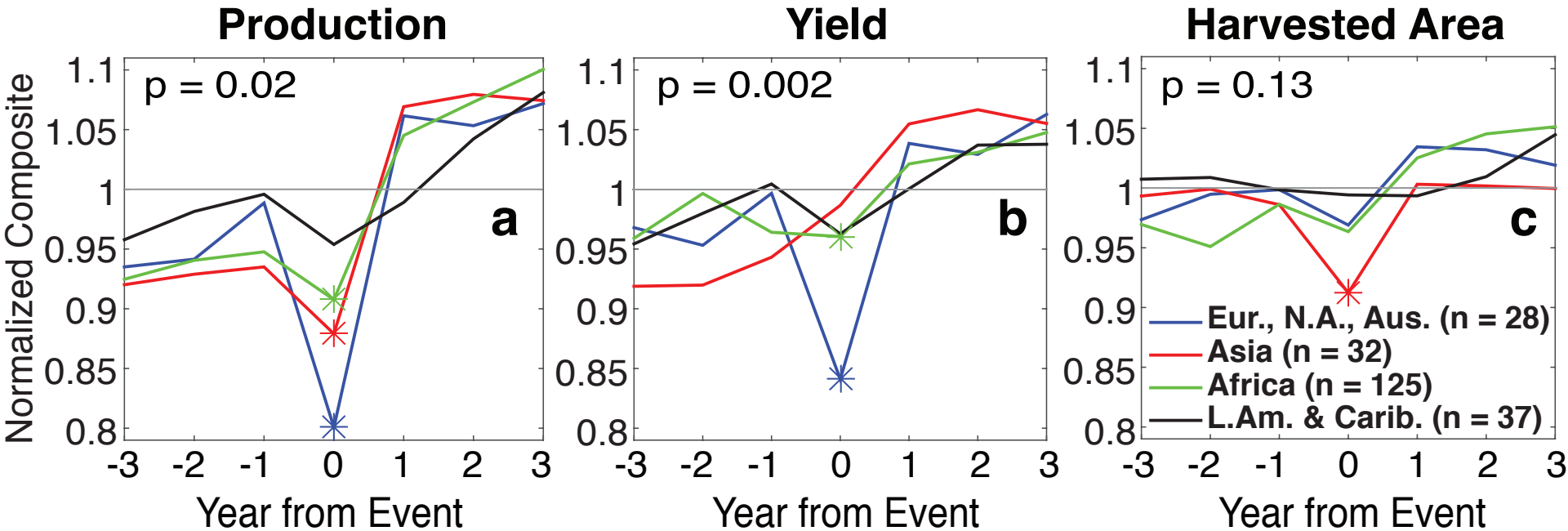


**Drought (n = 222)****Extreme Heat (n = 32)****Flood (n = 756)****Extreme Cold (n = 51)**

# Processes of change: complete loss or degradation



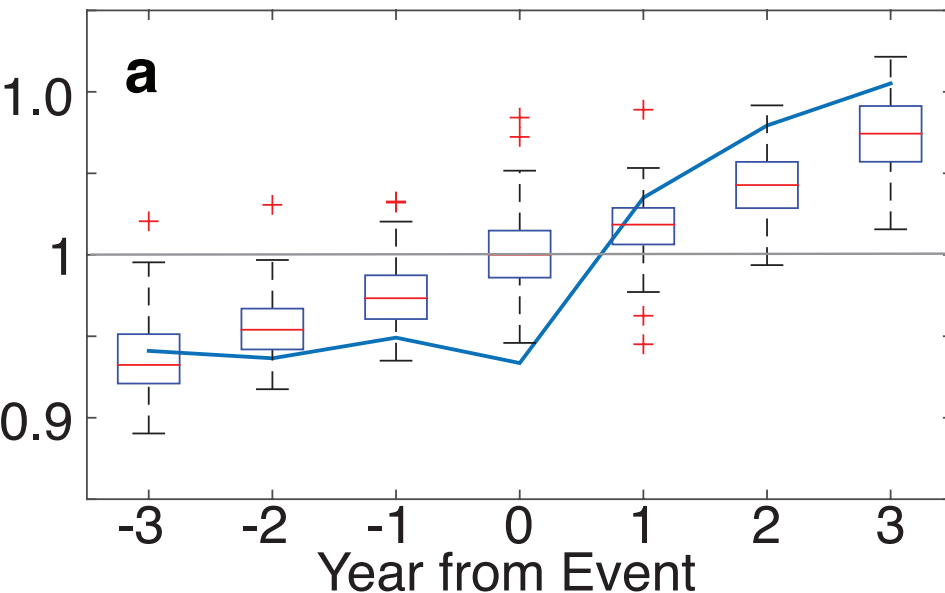
# Regional impacts



# Are droughts becoming more severe?

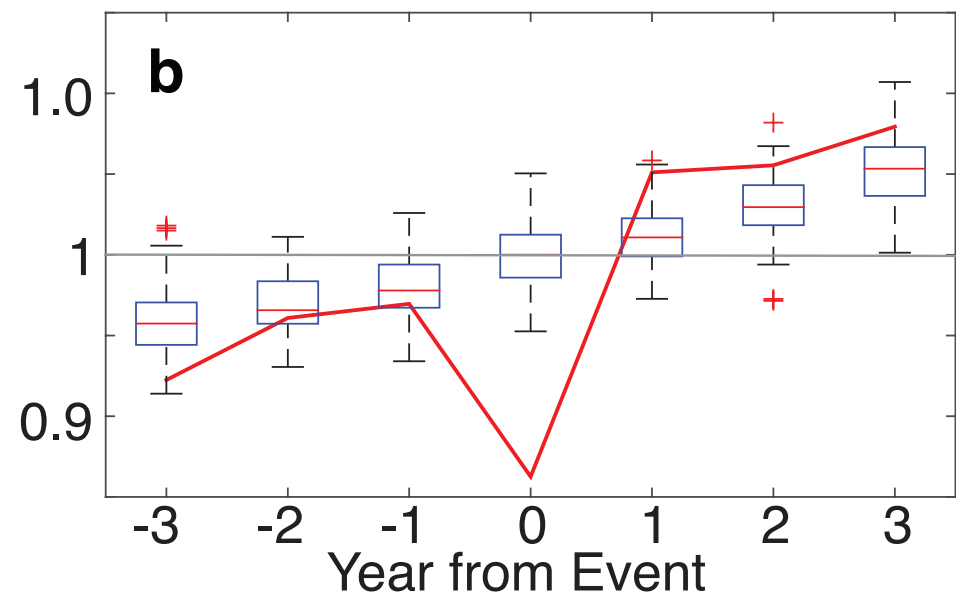
**Earlier (1964-1984)**

**n = 126**



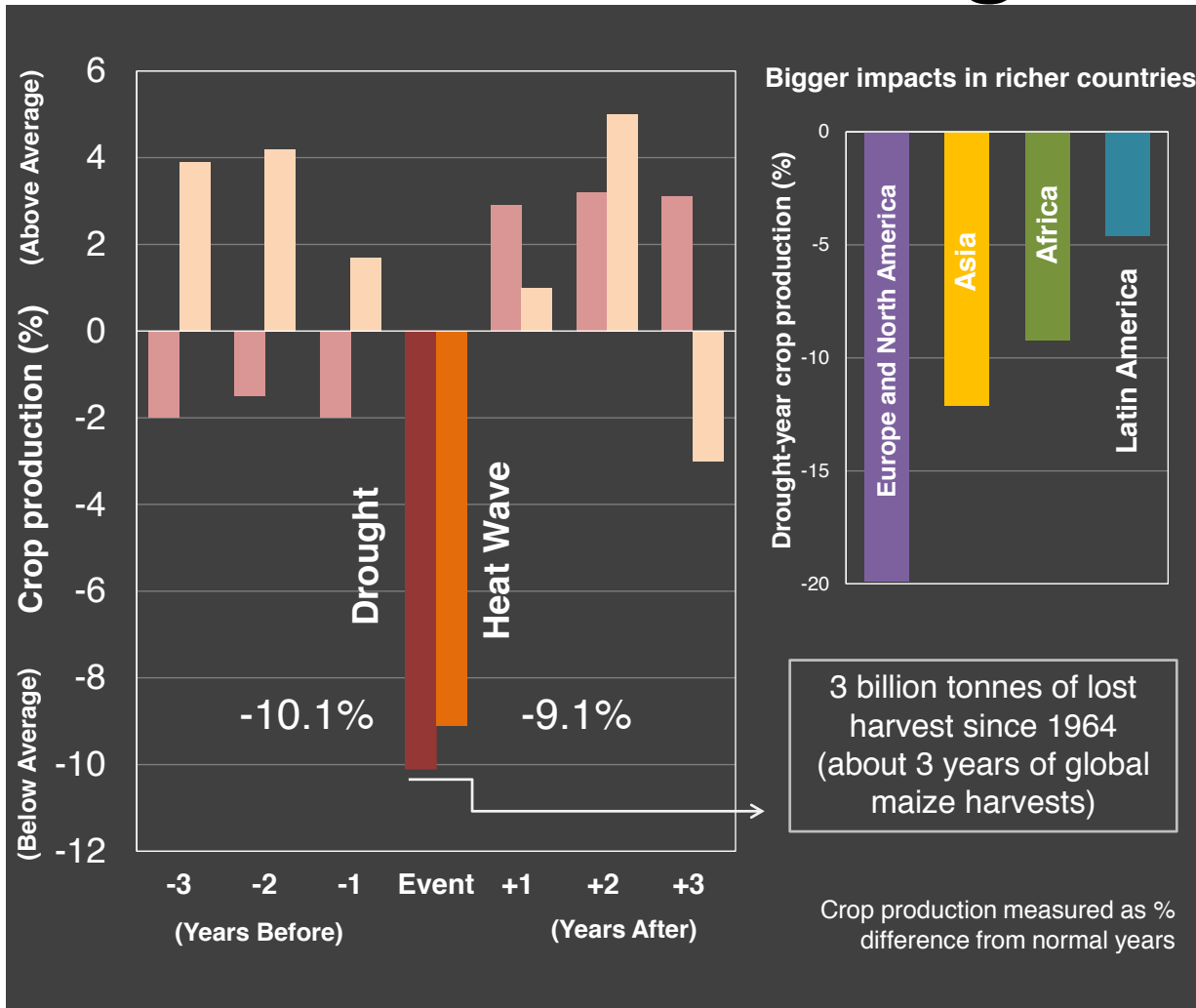
**Later (1985-2007)**

**n = 121**





# Take home messages



# Next steps

NATURE | LETTER



日本語要約

## Influence of extreme weather disasters on global crop production

**Corey Lesk, Pedram Rowhani & Navin Ramankutty**

**[Affiliations](#) | [Contributions](#) | [Corresponding author](#)**

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# Next steps:

- Improve/revisit/discuss methodology
  - Focus on subnational disasters
  - Focus on subnational crop data
  - Focus on growing seasons
  - Estimate \$ loss

**THANK YOU!**

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