Potsdam Institute for Climate Impact Research

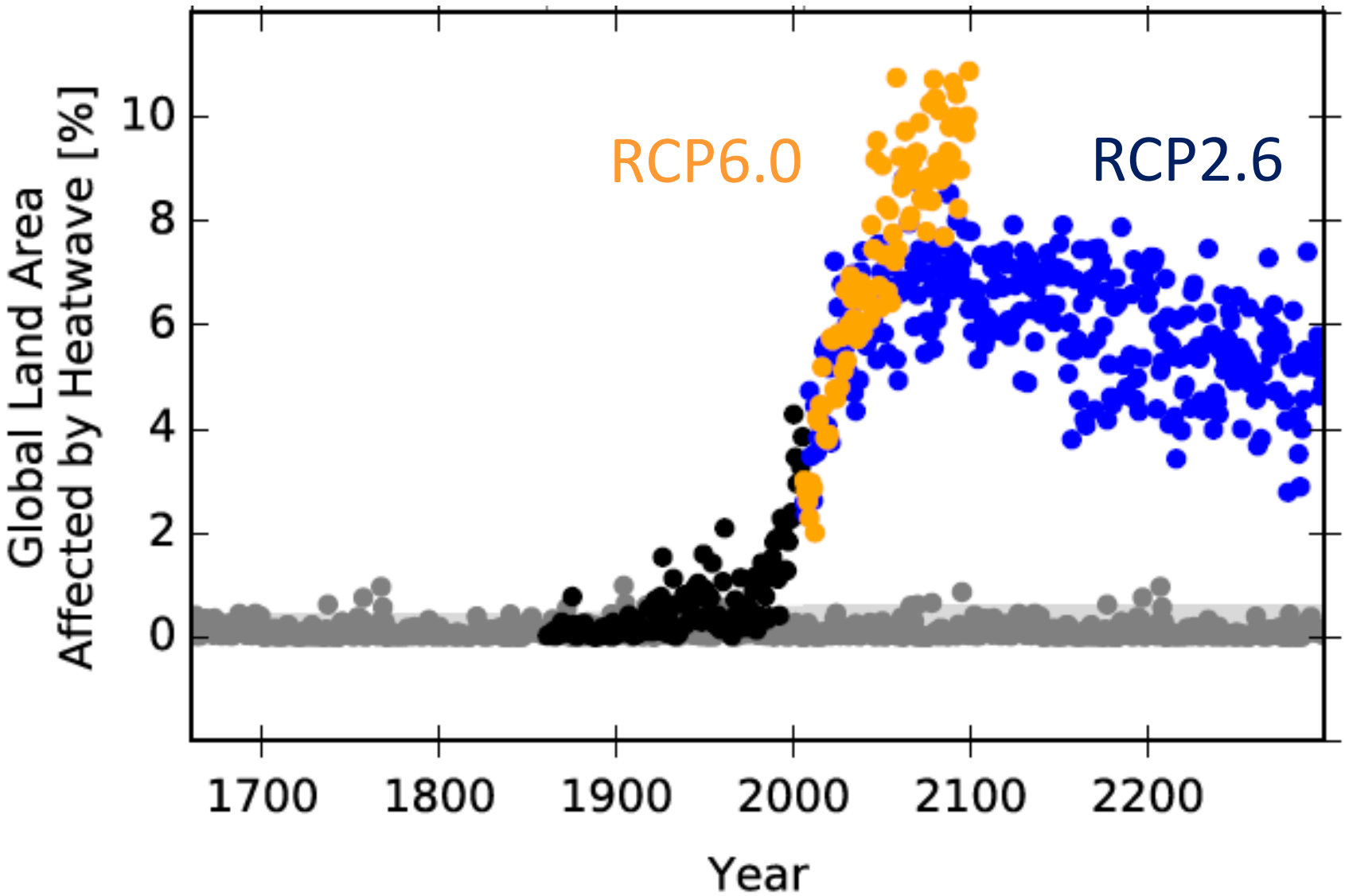
Welchen Unterschied machen 0.5°C?

Dr. Katja Frieler, Potsdam Institut für Klimafolgenforschung

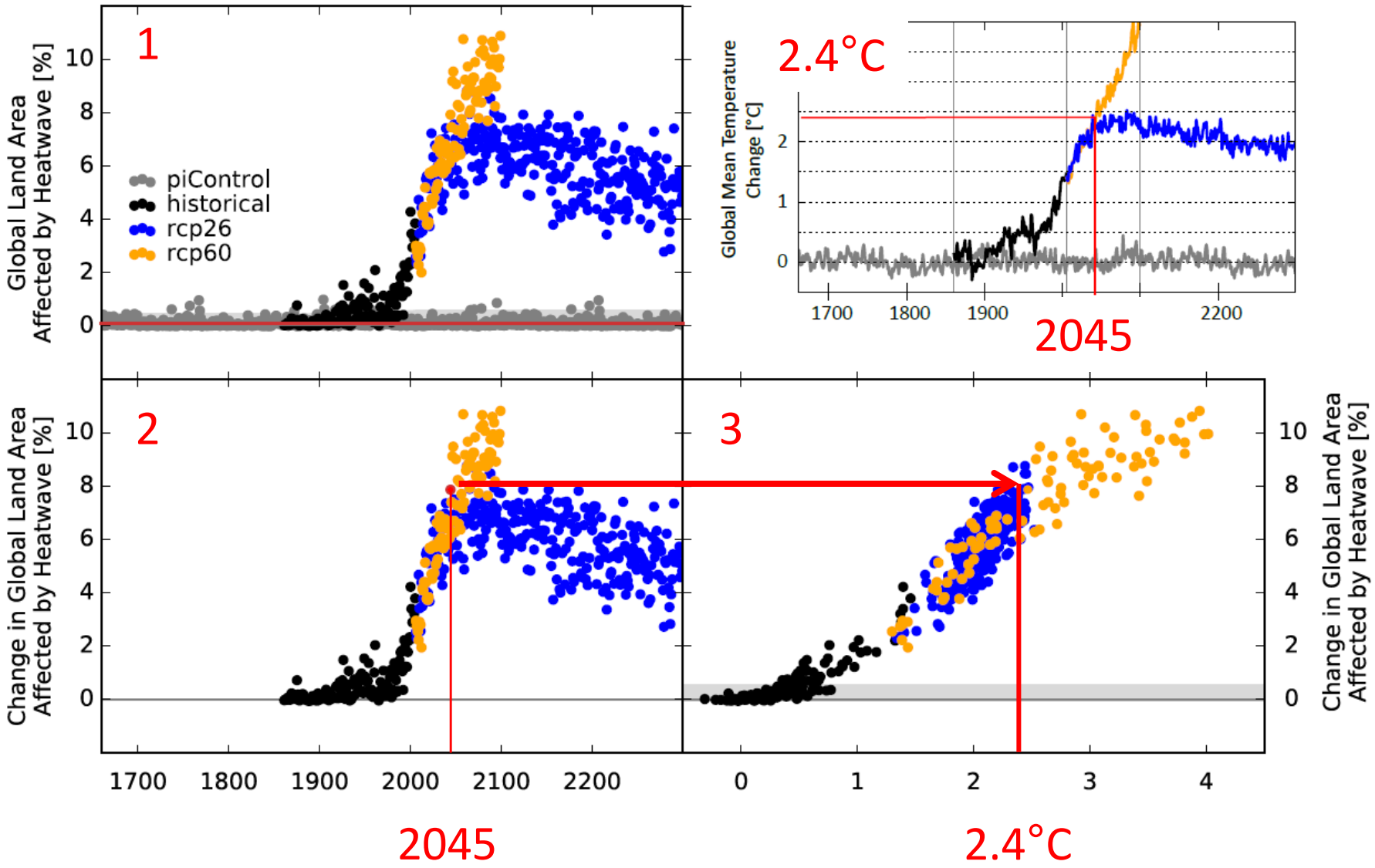
Deutsches Klima-Konsortium, Berlin, 26. September 2018

Member of Leibniz Association

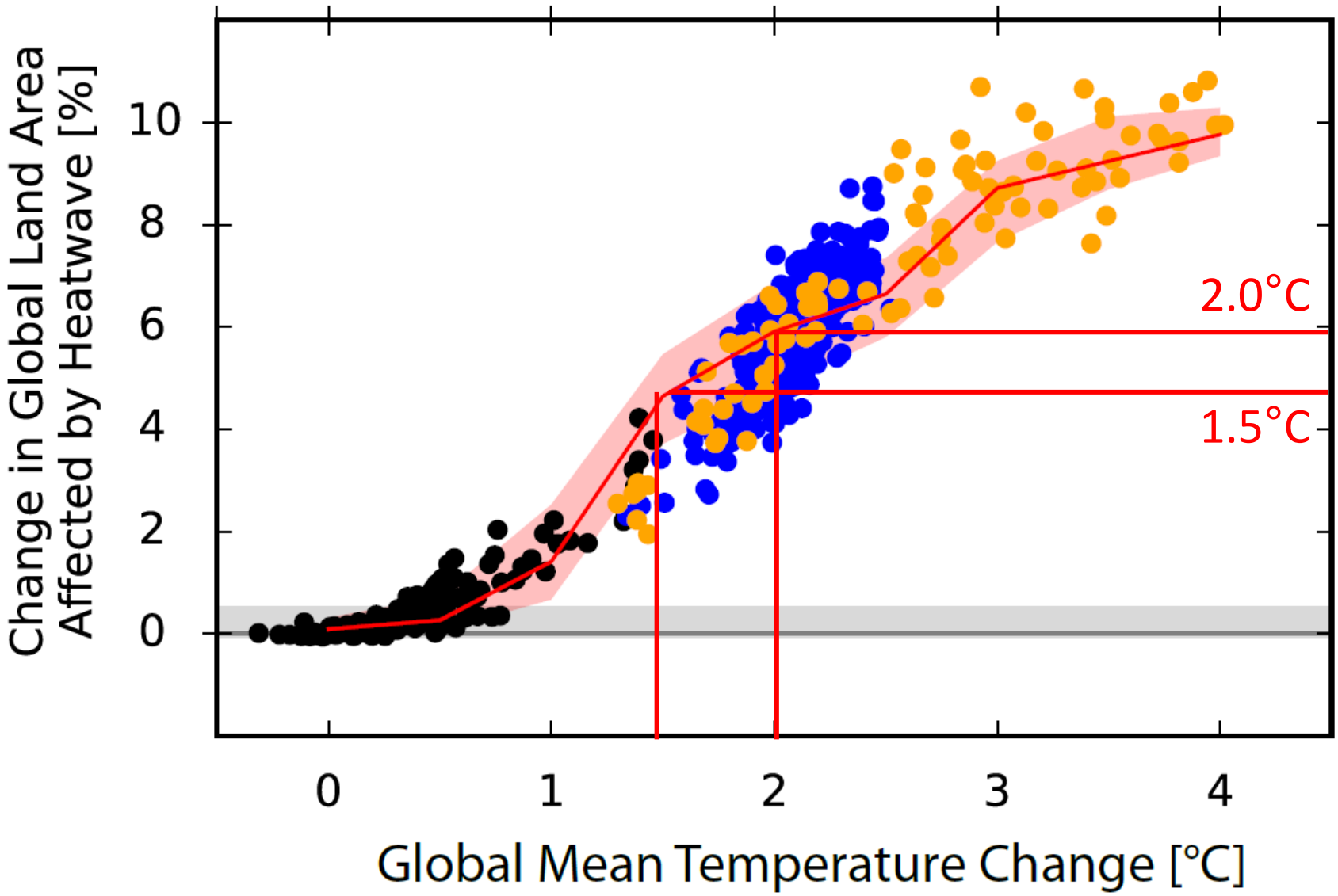
Hitzewellen breiten sich aus



Von der Zeit- zur globalen Temperaturachse



… was 0.5°C ausmachen

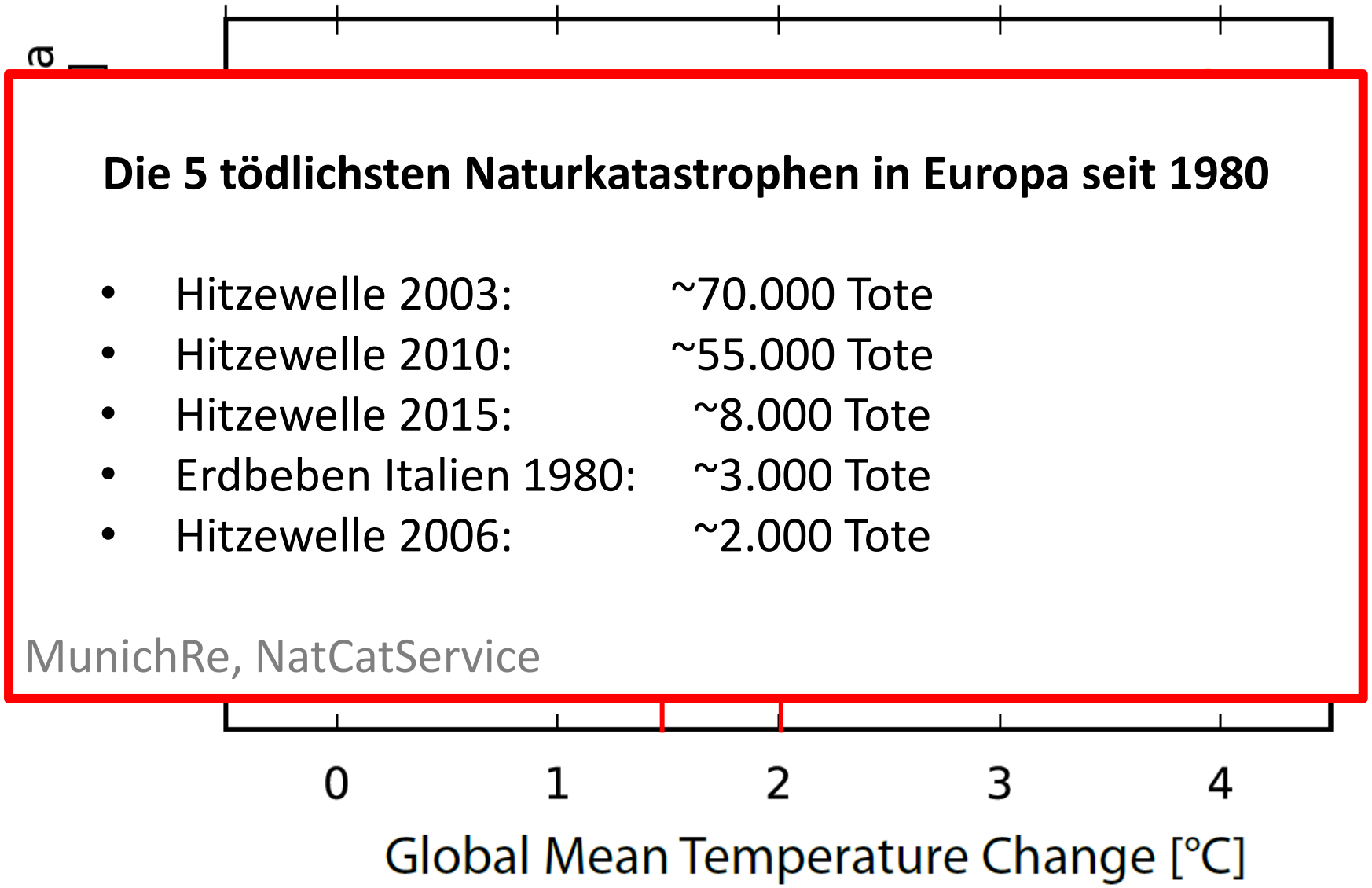


… was 0.5°C ausmachen

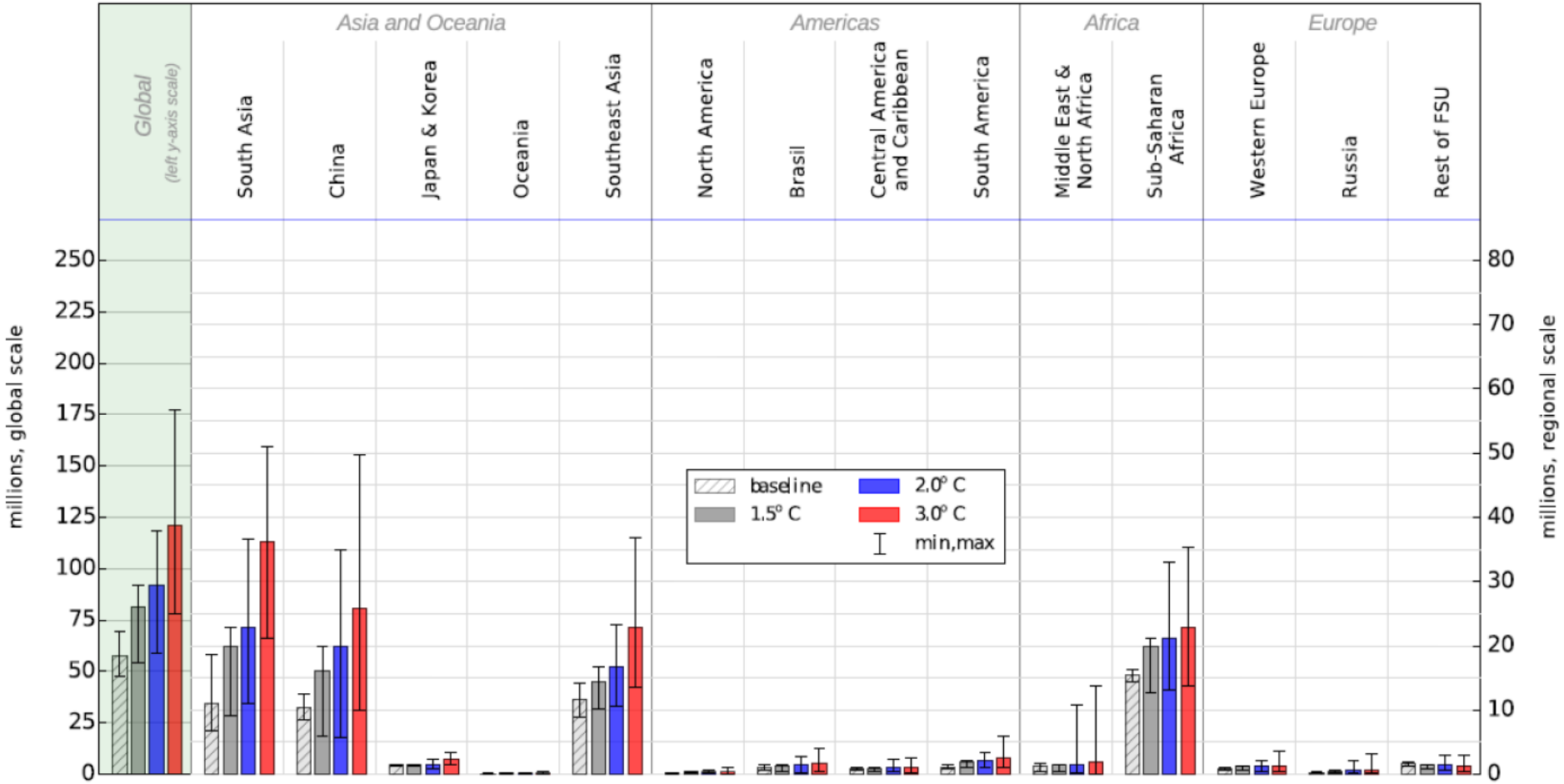
Die 5 tödlichsten Naturkatastrophen in Europa seit 1980

- Hitzewelle 2003: ~70.000 Tote
- Hitzewelle 2010: ~55.000 Tote
- Hitzewelle 2015: ~8.000 Tote
- Erdbeben Italien 1980: ~3.000 Tote
- Hitzewelle 2006: ~2.000 Tote

MunichRe, NatCatService



Zunahme von Überflutungsrisiken



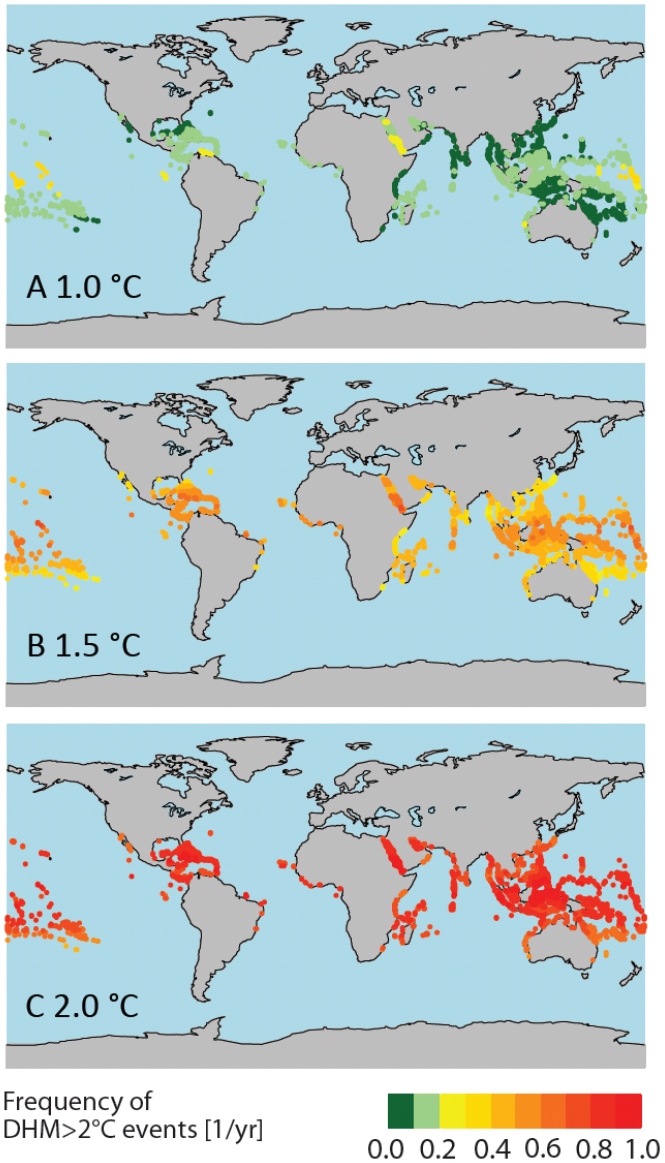
Zunahme der betroffenen Menschen mit der globalen Temperatur

Dottori et al., NCC, 2018

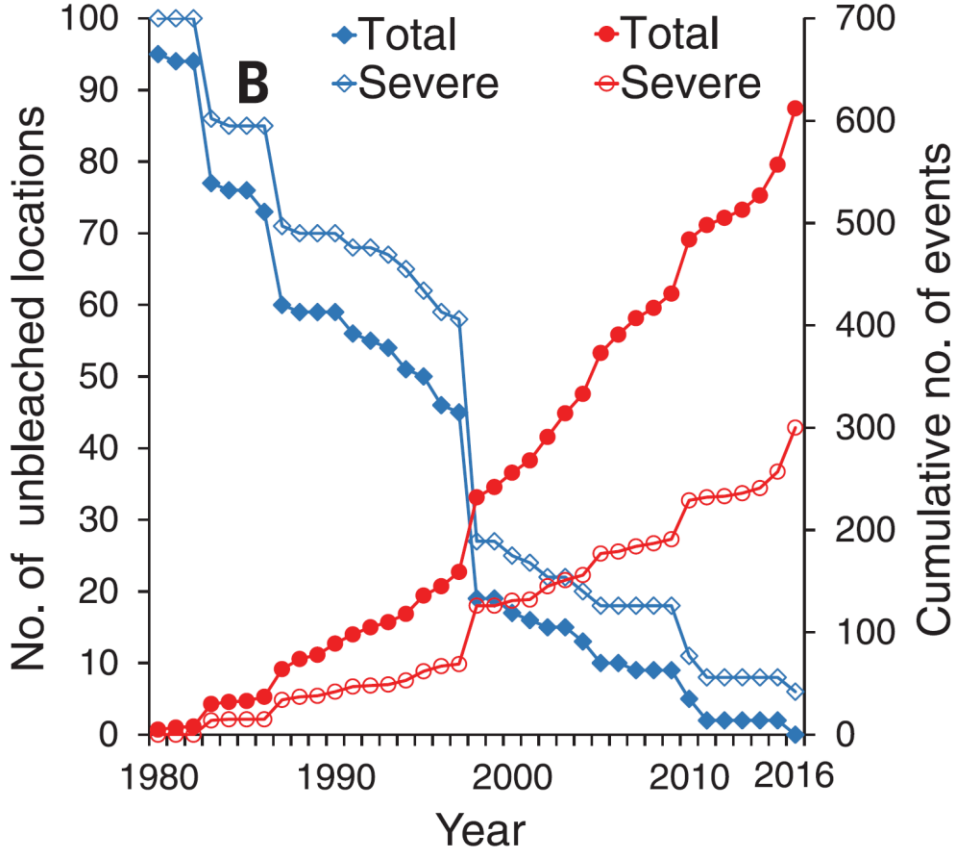
Erwärmung zerstört Korallenriffe…

…vor unseren Augen

Prognose



Frieler et al., NCC, 2012

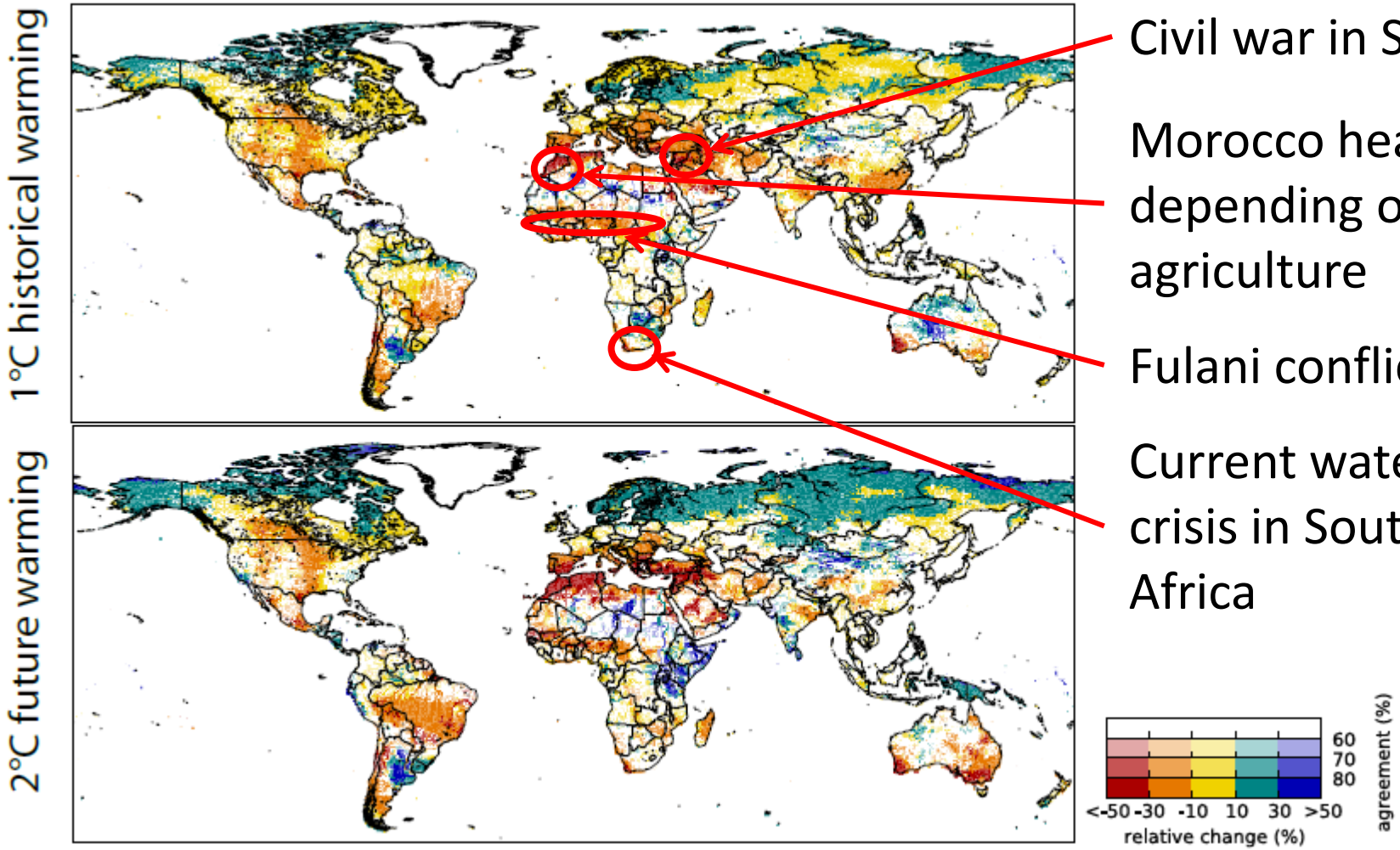


Erholungszeit hat sich auf einen mittleren Wert von 6 Jahre reduziert.

Hughes et al., Science, 2018

Veränderungen in der Wasserverfügbarkeit

Relative change in discharge [%]



Civil war in Syria

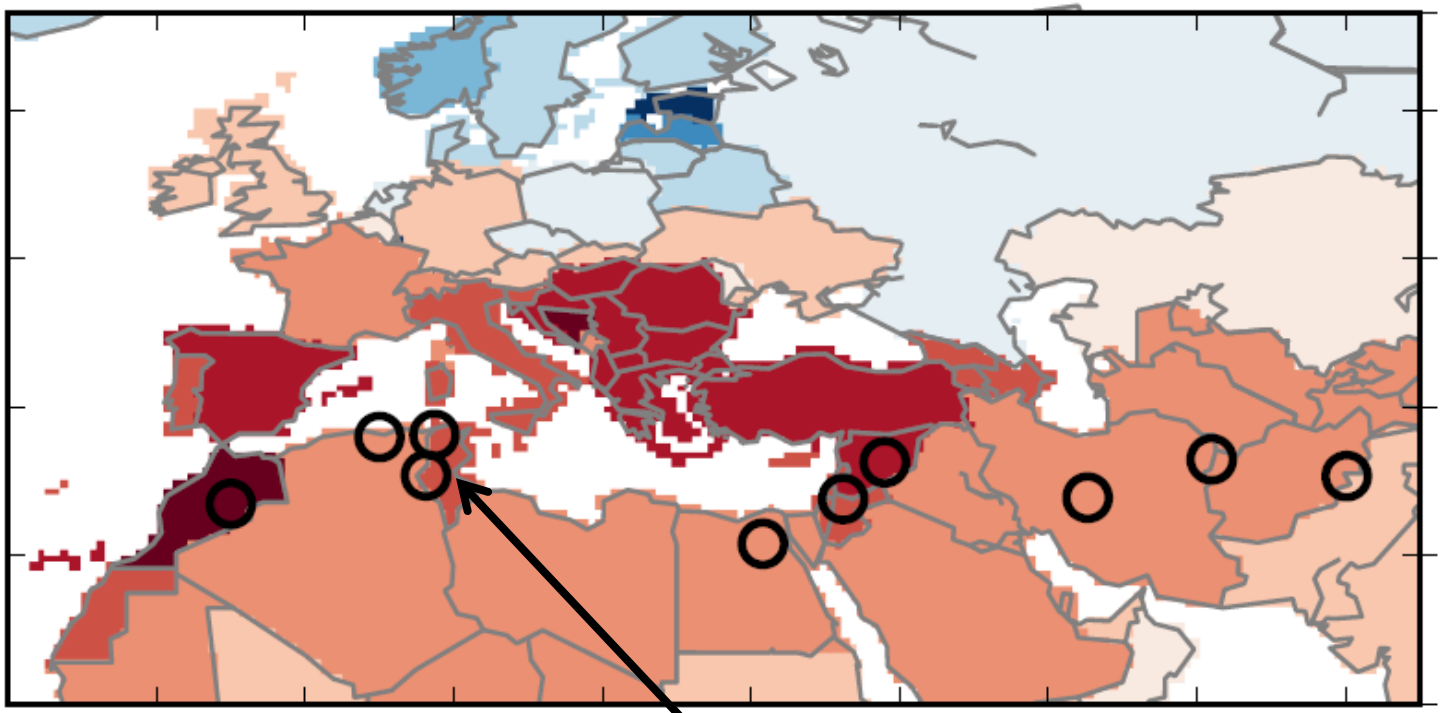
Morocco heavily depending on agriculture

Fulani conflict

Current water crisis in South Africa

Relative Veränderung der von Dürren betroffenen Flächen

2°C future warming

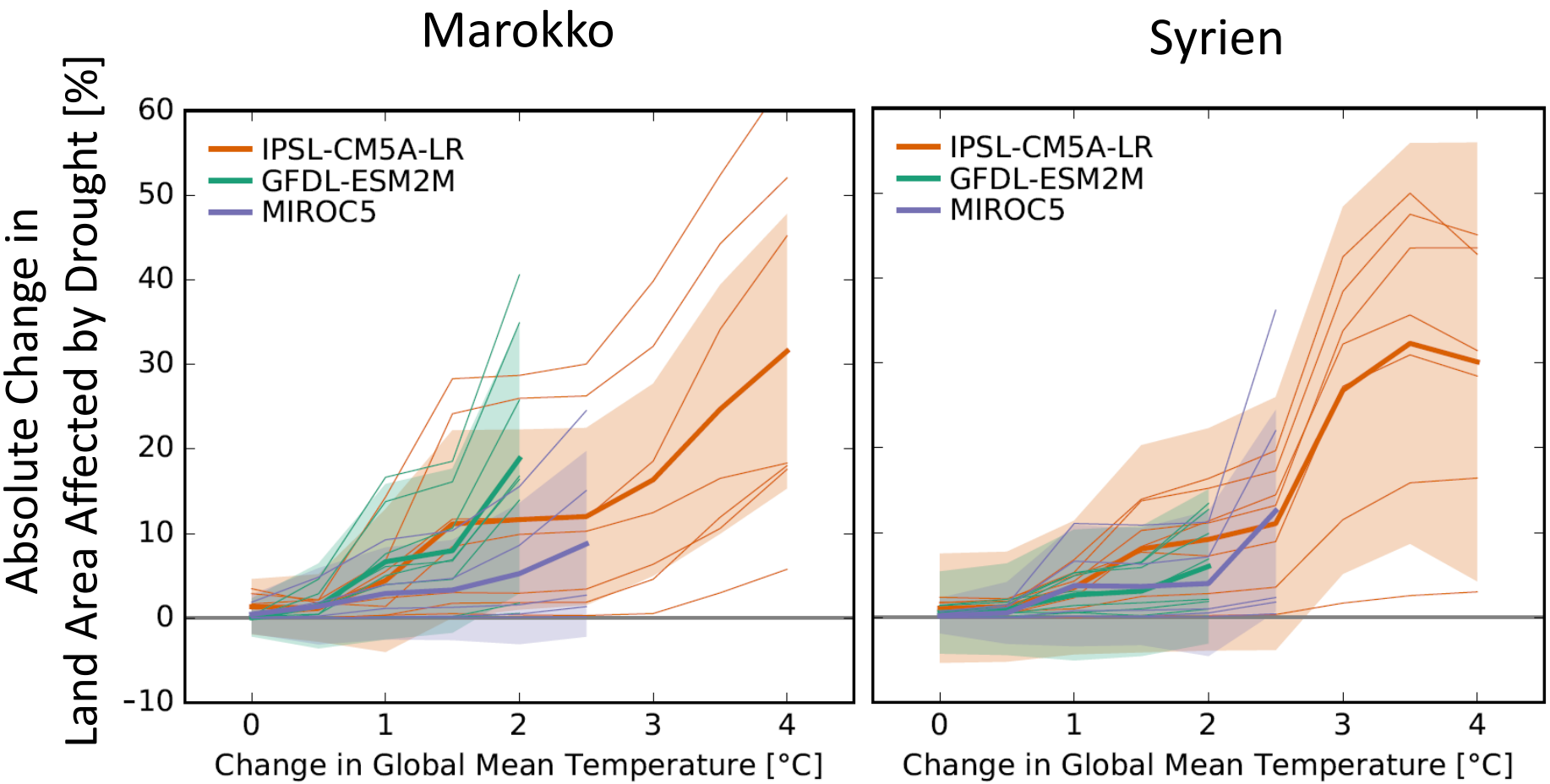


Water scarcity related conflicts (2010 - present)

Water Conflict Chronology, Pacific Institute for Studies in Development, Environment, and Security

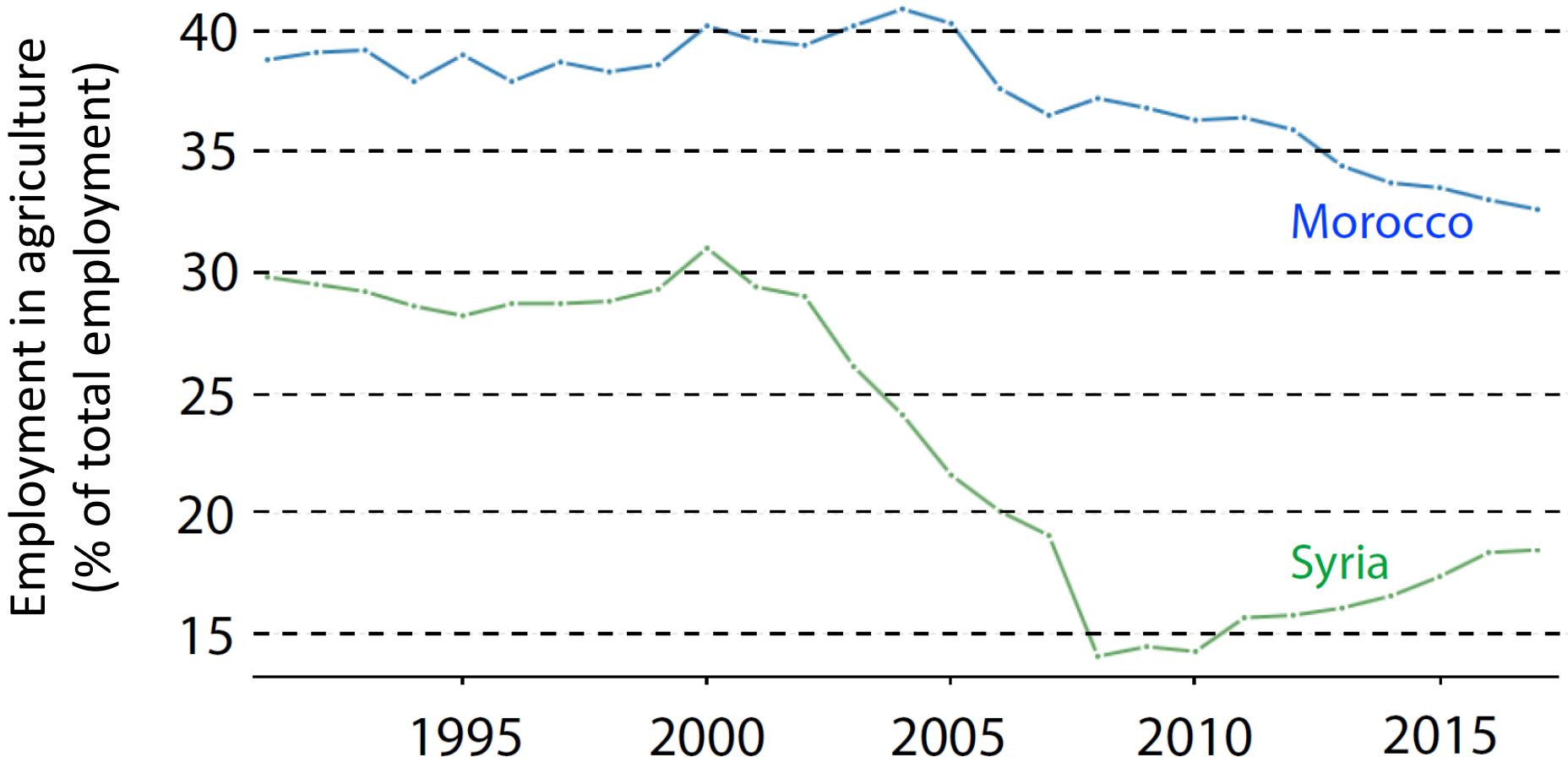
Lange et al., to be submitted

Dürreprojektionen



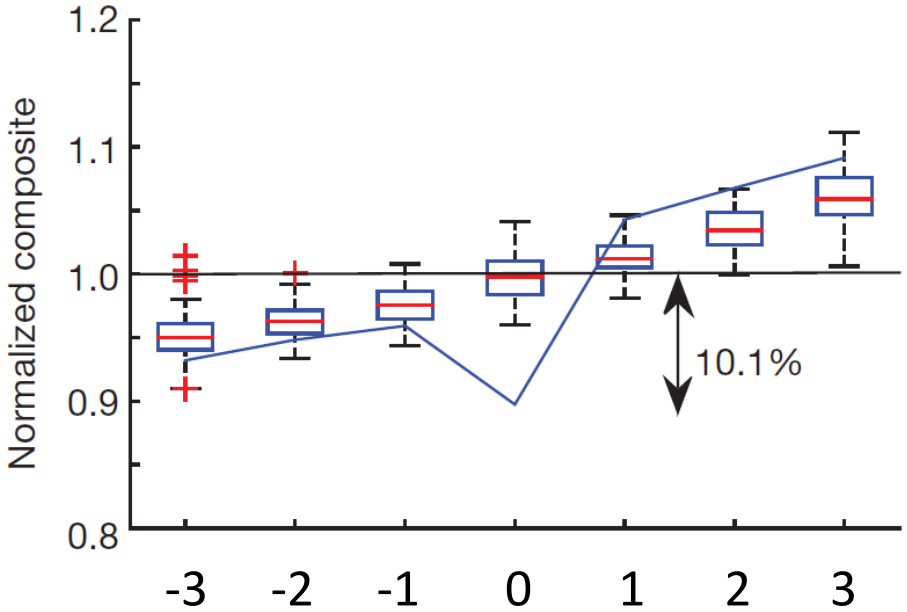
Lange et al., to be submitted

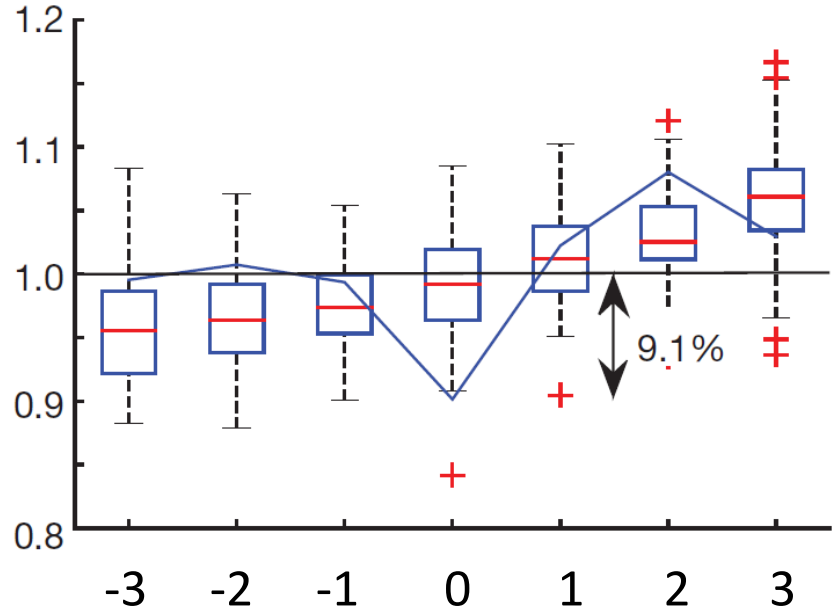
Relevanz der Landwirtschaft: Beschäftigungszahlen



International Labour Organization, ILOSTAT database

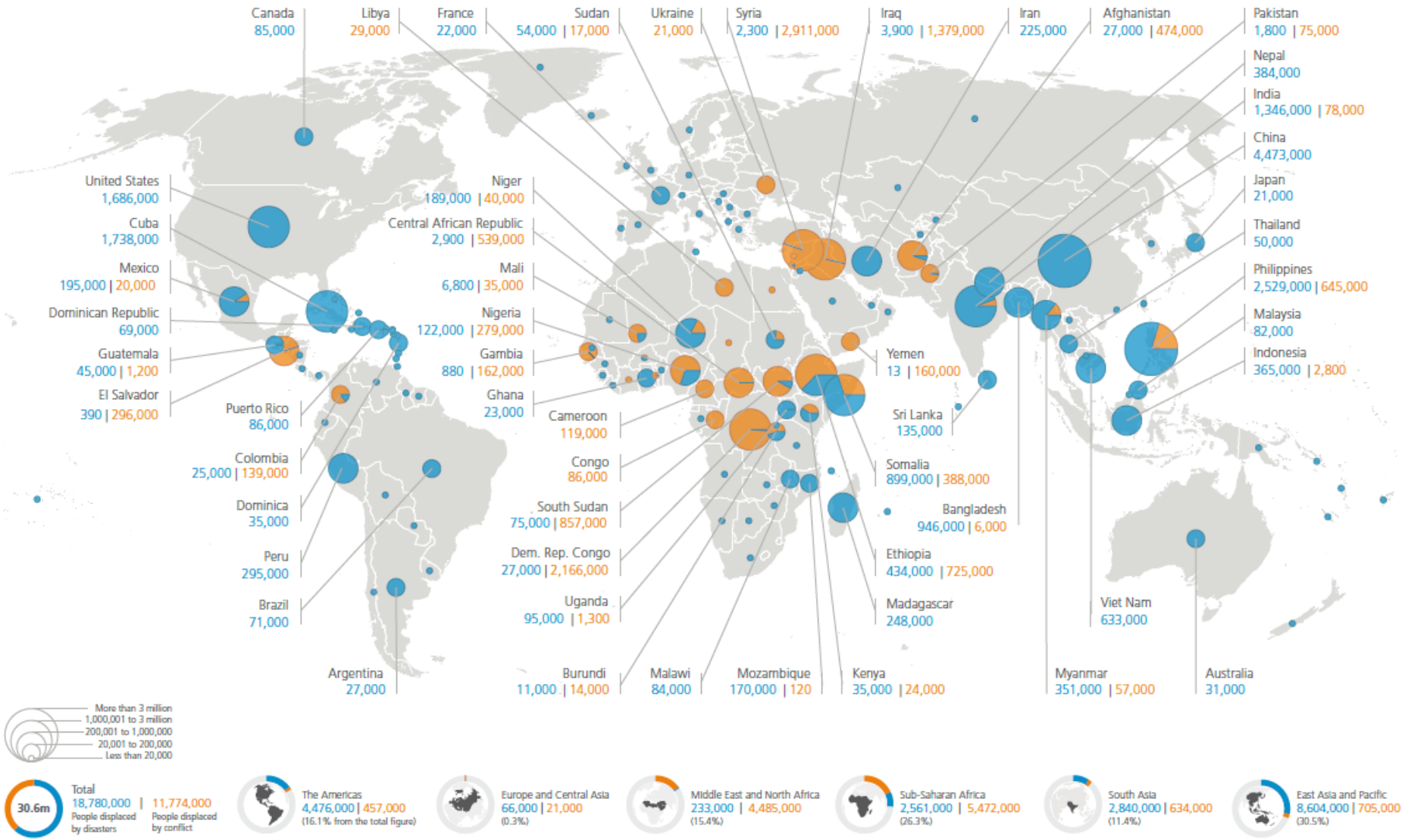
Ernterückgänge durch Dürren und Hitze





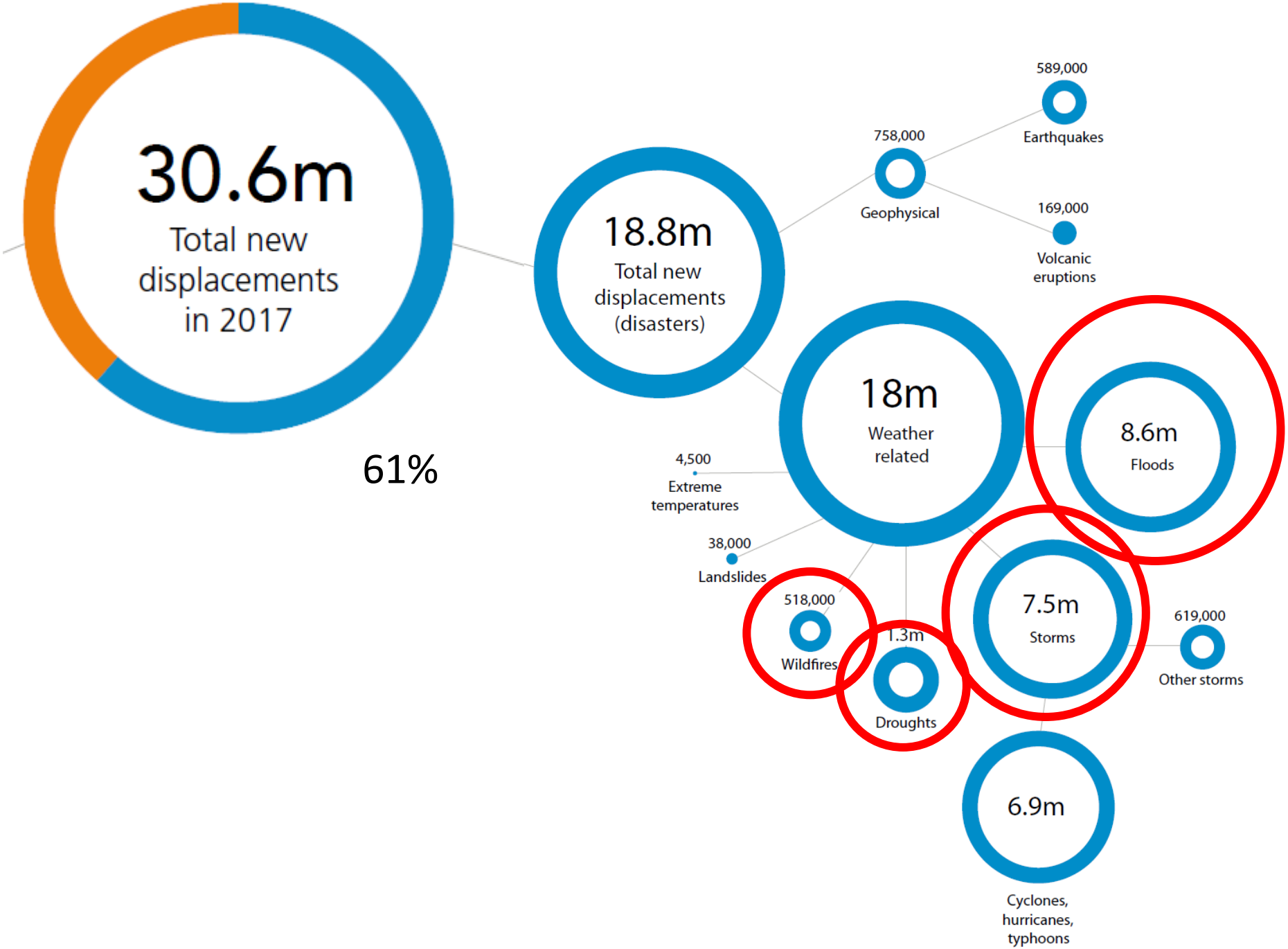
Lesk et al., 2016, Nature

NEW DISPLACEMENT BY CONFLICT AND DISASTERS IN 2017



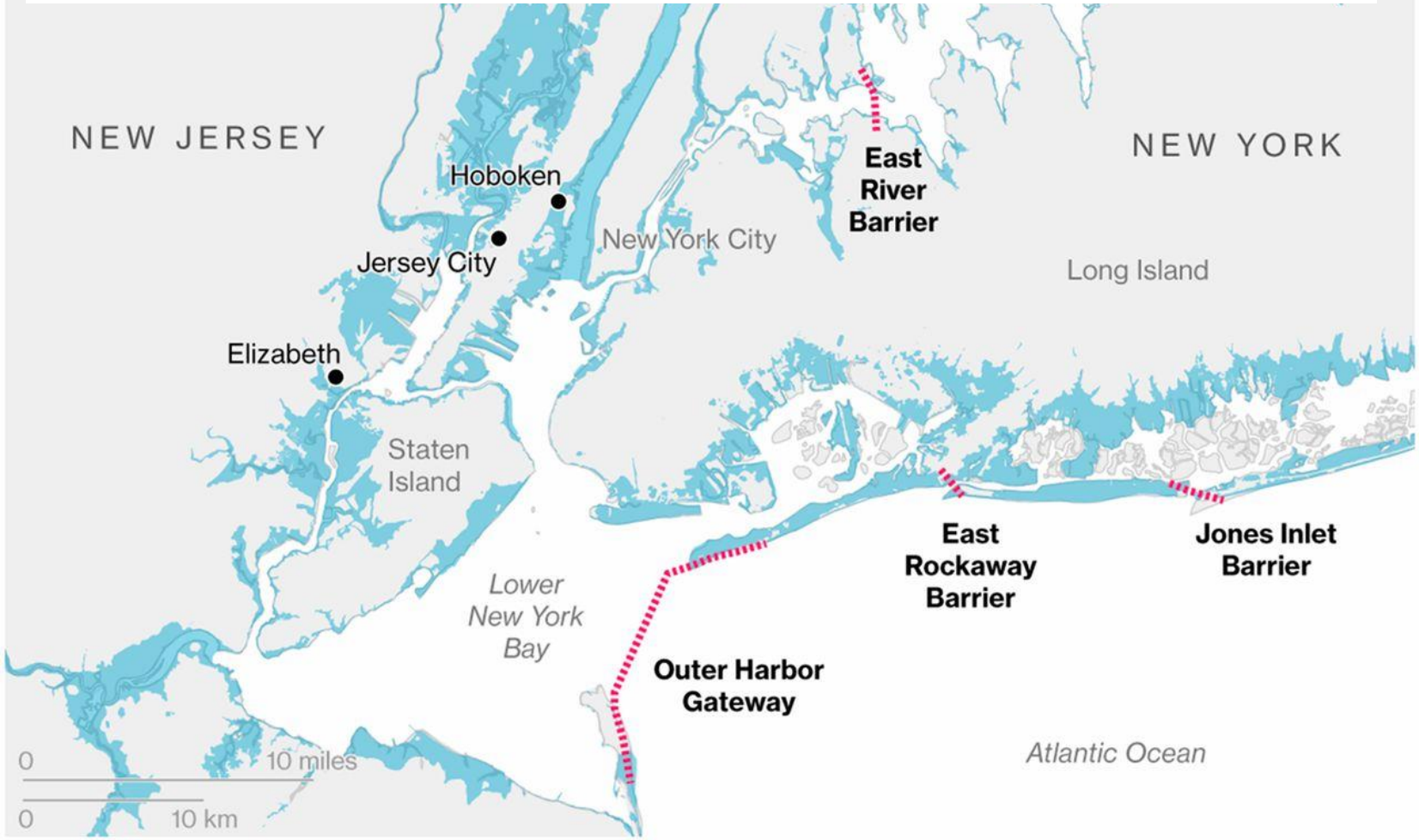
iDMC internal displacement monitoring centre

NORWEGIAN REFUGEE COUNCIL NRC


30.6m
Total new displacements in 2017
61%
18.8m
Total new displacements (disasters)
758,000
Geophysical
589,000
Earthquakes
169,000
Volcanic eruptions
18m
Weather related
4,500
Extreme temperatures
38,000
Landslides
518,000
Wildfires
1.3m
Droughts
8.6m
Floods
7.5m
Storms
619,000
Other storms
6.9m
Cyclones, hurricanes, typhoons

… durch den Meerespiegelanstieg

NYC flooding resulting from Sandy, October 29, 2012



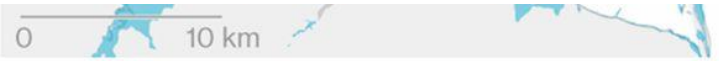
Stefan Rahmstorf PNAS 2017;114:11806-11808

… durch den Meerespiegelanstieg

NYC flooding resulting from Sandy, October 29, 2012

Eine „Einmal-in-500-Jahren“-Sturmflut ist inzwischen zu einer „Einmal in 25-Jahren“ Sturmflut geworden und wird über die nächsten 30 Jahre zu einer „Einmal-in-5-Jahren“- Sturmflut

Date	Country/Region	Event	Fatalities	Overall losses US$ m	Insured losses US$ m
25.8-1.9.2017	USA	Hurricane Harvey	88	85,000	30,000*
6-14.9.2017	USA, Caribbean	Hurricane Irma	128	67,000	32,000*
19-22.9.2017	Caribbean	Hurricane Maria	108	63,000	30,000*
8-20.10.2017	USA	Wildfire	25	10,500	8,000*
22.6-5.7.2017	China	Flood, landslide	56	6,000	-
19.9.2017	Mexico	Earthquake	369	6,000	2,000



Stefan Rahmstorf PNAS 2017;114:11806-11808

…wir werden das Bild vervollständigen

Climate Projections
Global: CMIP5/6
(4 GCMs x 2 RCPs)

Socio-economic input
SSP population and GDP (mainly SSP2)

Impact Models

Global
Water
Agriculture
Ecosystems
Infrastructure
Health
Fishery
Energy
Permafrost

Regional
Water
Forestry
Lakes
Health

Synthesis of Impacts at different levels of warming

~ 70 models

ISIMIP
Inter-Sectoral Impact Model Intercomparison Project