



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

## **The Economics of Civil War: Climate, Poverty and Trade**

**Edward Miguel**

*Selected Paper prepared for presentation at the International Agricultural Trade Research Consortium's (IATRC's) 2014 Annual Meeting: Food, Resources and Conflict, December 7-9, 2014, San Diego, CA.*

*Copyright 2014 by Edward Miguel. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.*

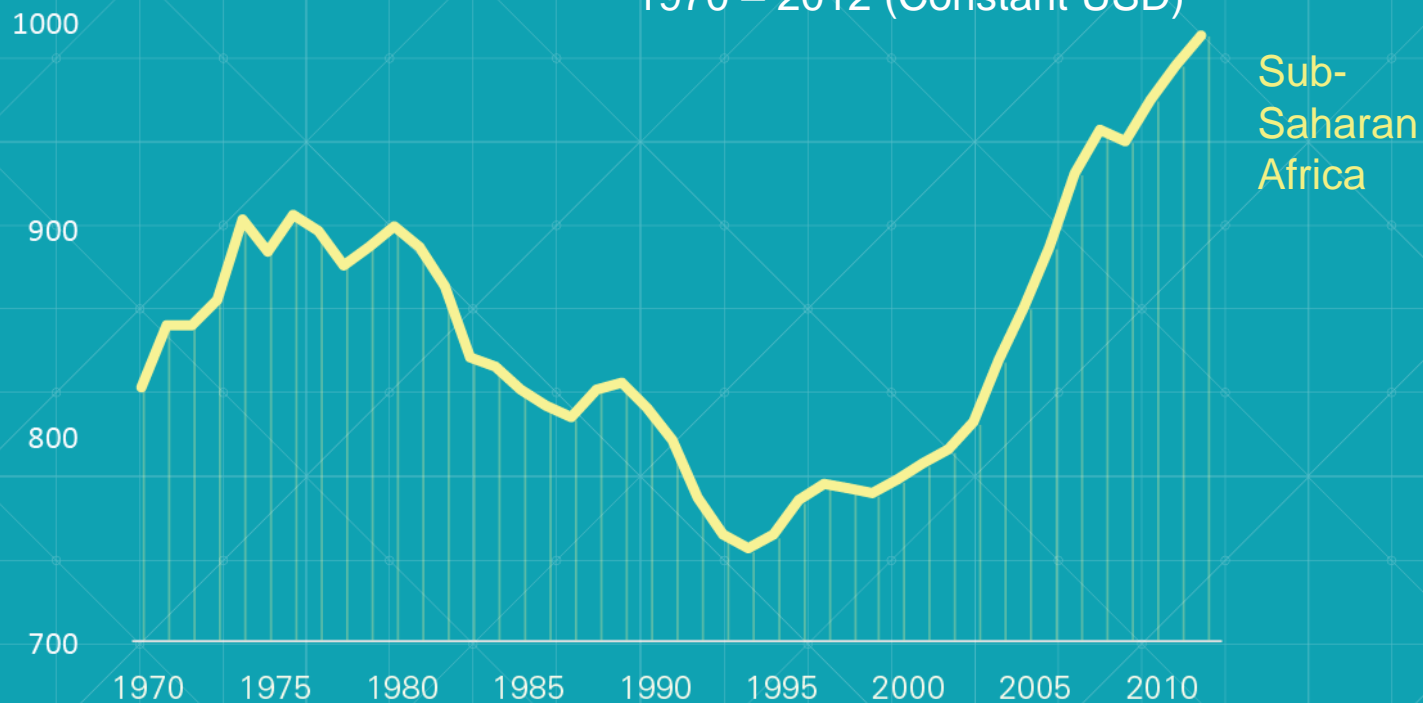
# CLIMATE, CONFLICT, TRADE & DEVELOPMENT



credit: Oxfam

# AFRICAN PER CAPITA INCOME

1970 – 2012 (Constant USD)



Source: World Bank









# CLIMATE CHANGE —→ POVERTY & CONFLICT?

80% OF AFRICAN  
countries have  
experienced at  
least ONE YEAR of  
ARMED CONFLICT  
since 1980



(Source: UCDP/PRIO)



**INCOMES FELL 40%**  
during Sierra Leone's civil war  
(Source: Casey et al 2014)



# ARMED CONFLICT REDUCES INTERNATIONAL TRADE

Holds for civil & international wars  
with negative spillovers for neighboring  
countries, trading partners

(Source: Blomberg and Hess 2006, Qureshi 2013)

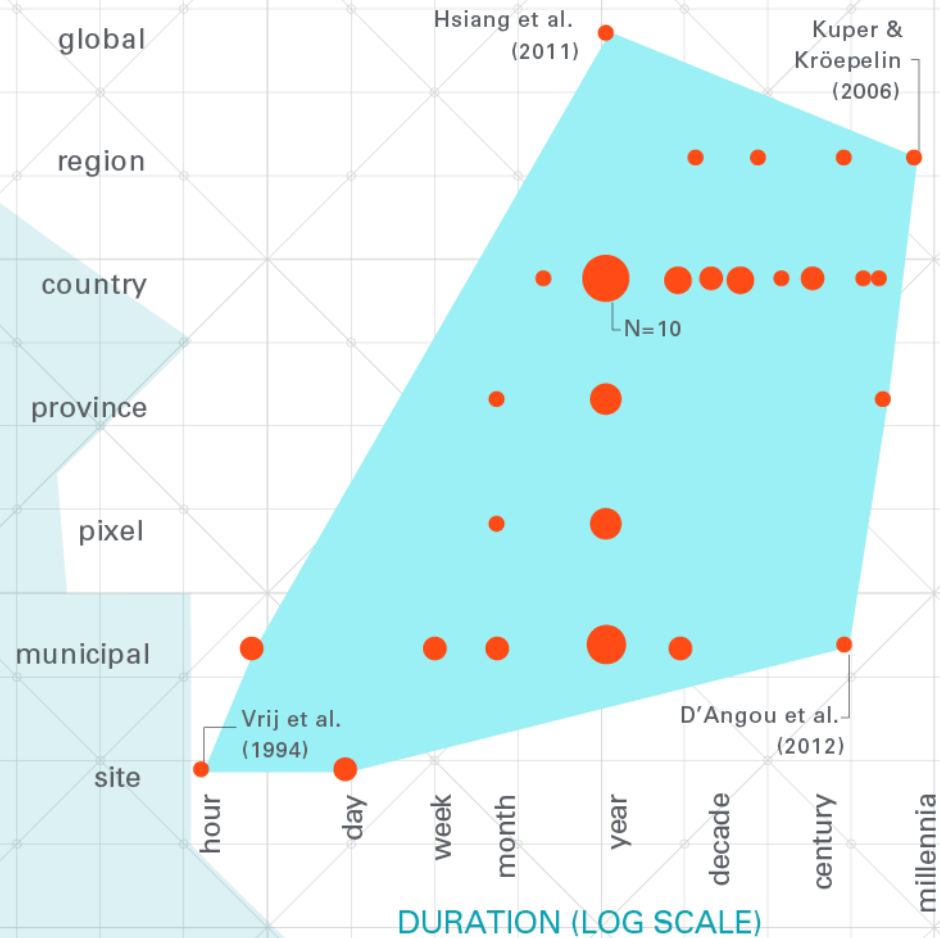
A photograph of a herd of cows in a dry, grassy field. The cows are of various colors, including black, white, and brown. They are scattered across the field, some standing and some grazing. In the background, there are trees and a fence line. The sky is clear and blue. The overall scene suggests a rural, agricultural setting.

# DOES EXTREME CLIMATE LEAD TO VIOLENT CONFLICT?

60 quantitative studies from economics,  
archeology, psychology, history,  
criminology, political science

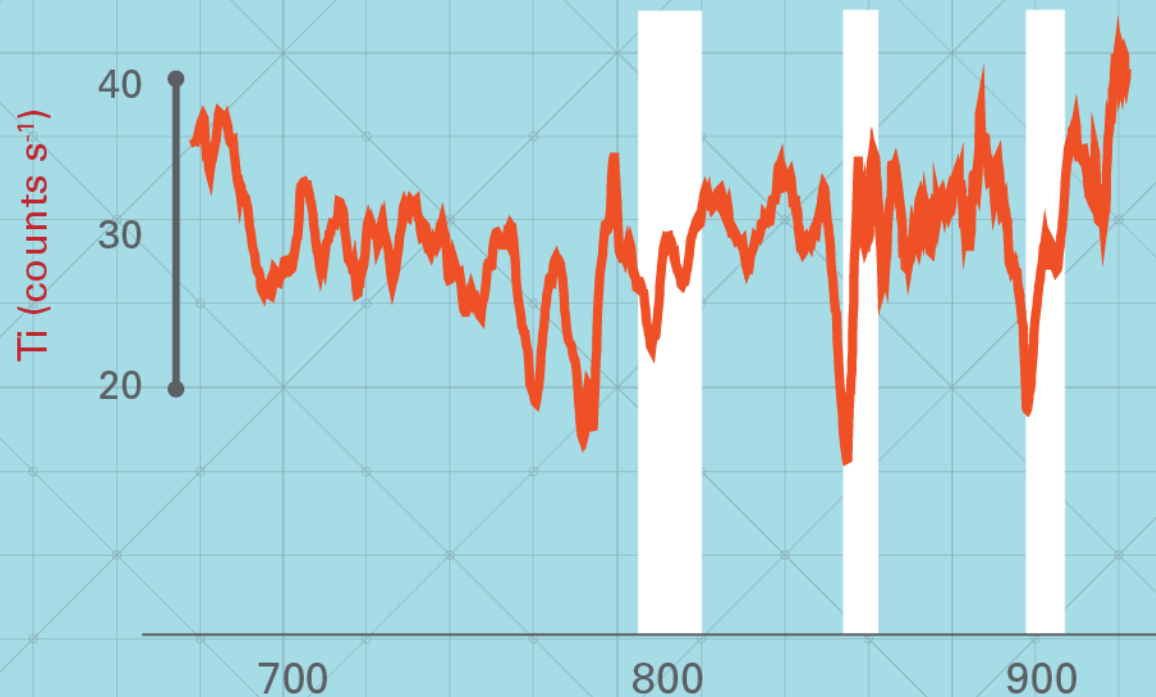
(Source: Hsiang, Burke and Miguel, Science 2013)

# STUDIES BY DURATION & SCALE






## Major phases of collapse for the “Classic” Mayan empire (Mexico)



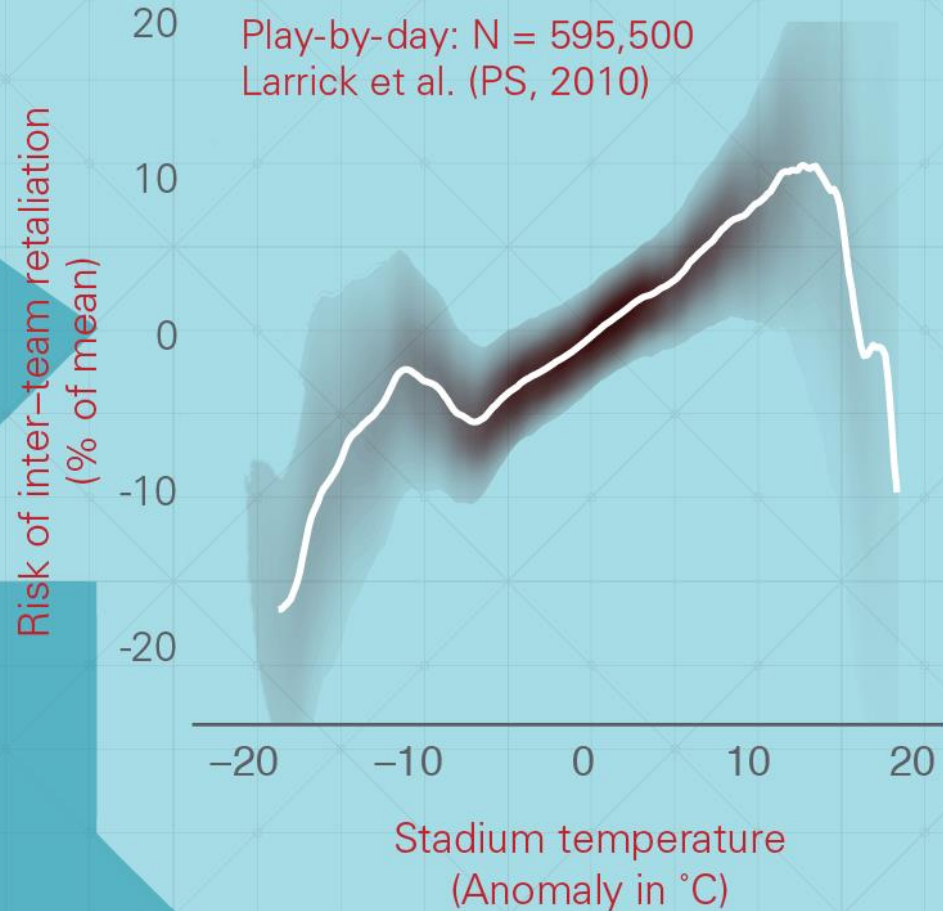
(Source: Haug et al. 2003, Science)



High temperatures make police  
trainees more aggressive, provoke  
“road rage” – and increase the risk  
that pitchers hit batters in baseball

(Sources: Kenrick et al. 1986; Vrij et al. 1994; Larrick et al. 2011)

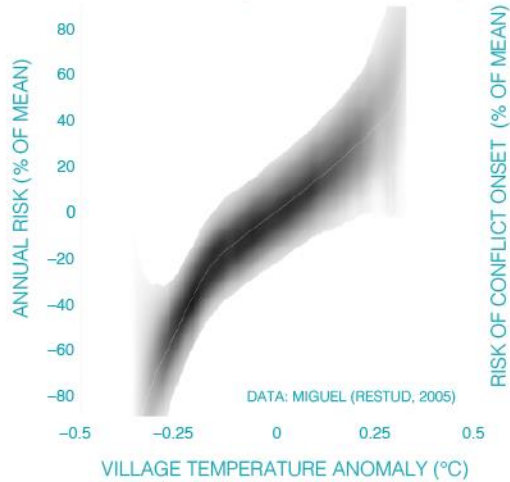
# VIOLENT INTER-GROUP RETALIATION (USA)



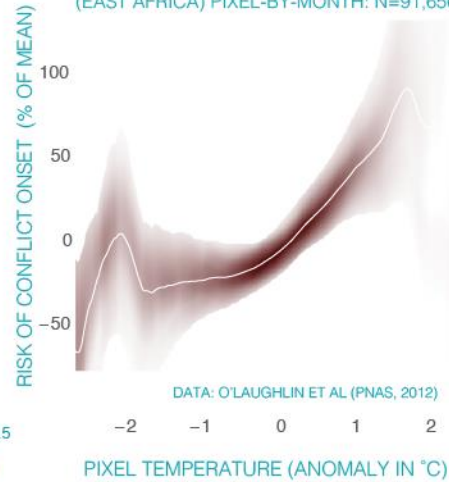


# TEMPERATURE AND VIOLENCE IN AFRICA

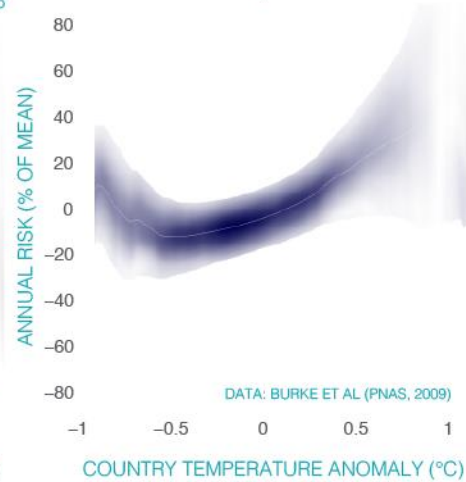
WITCH MURDER (TANZANIAN VILLAGES)



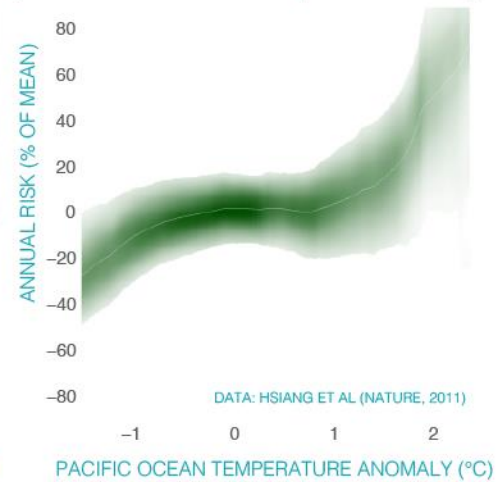
POLITICAL & INTER-GROUP VIOLENCE (EAST AFRICA) PIXEL-BY-MONTH: N=91,656



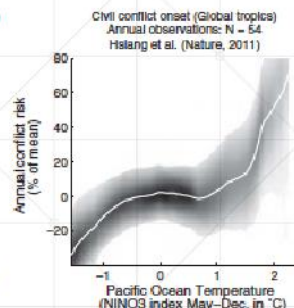
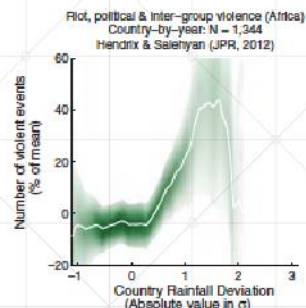
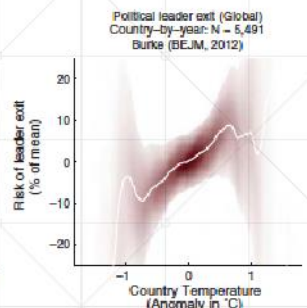
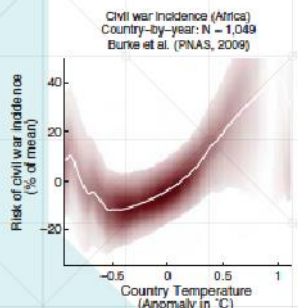
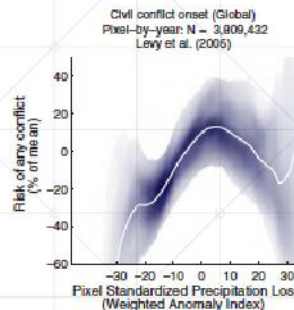
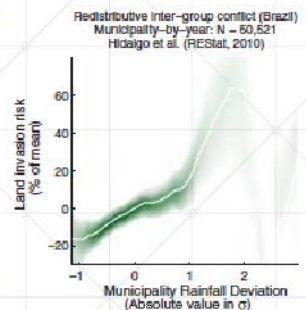
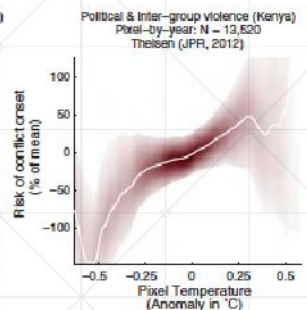
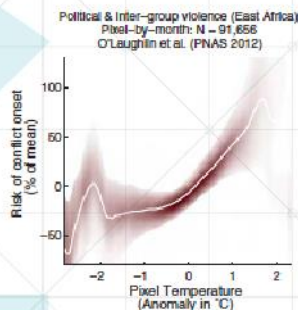
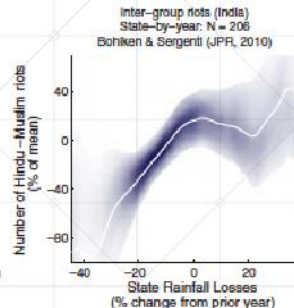
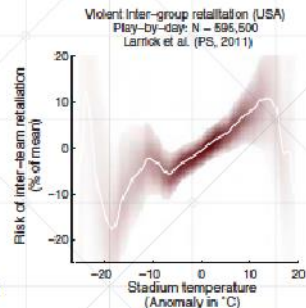
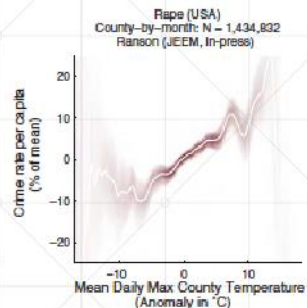
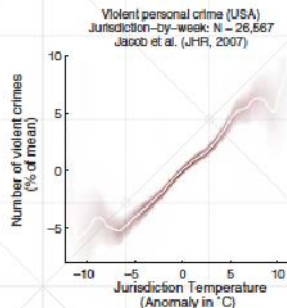
CIVIL WAR INCIDENCE (SUB-SAHARAN AFRICA)



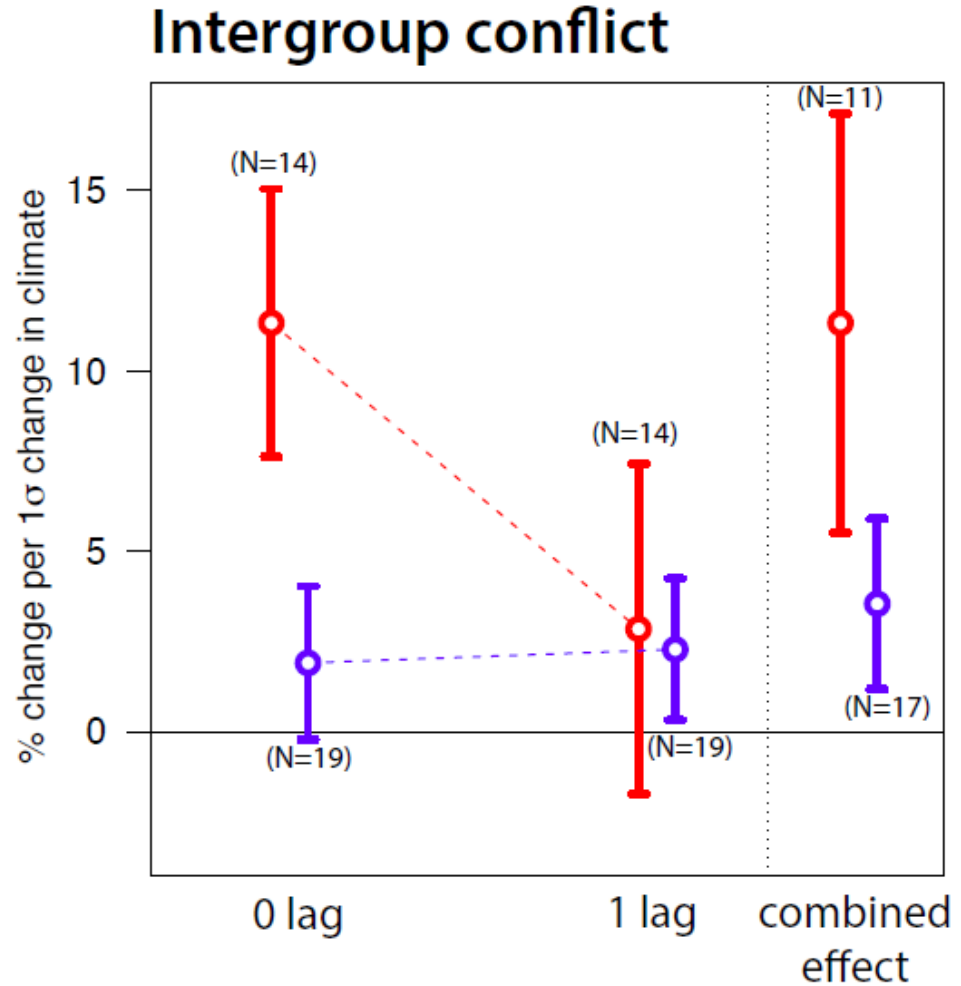
CIVIL CONFLICT ONSET (GLOBAL TROPICS)



High temps  
lead to more  
violence in  
27 OUT OF  
27 STUDIES



In a meta-analysis  
with 19 studies,  
+1 SD IN  
TEMPERATURE  
INCREASES  
VIOLENCE 12%



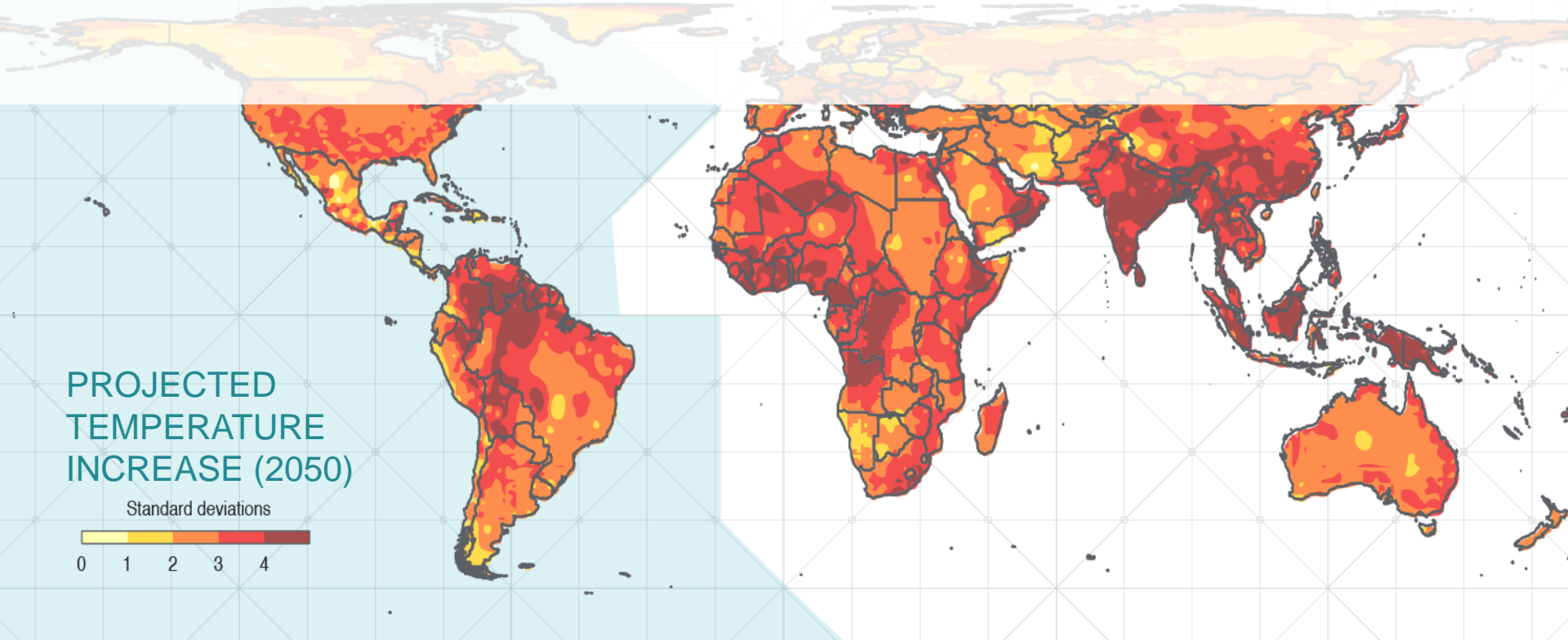
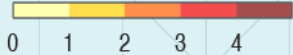


2°C rise (projected for 2050)

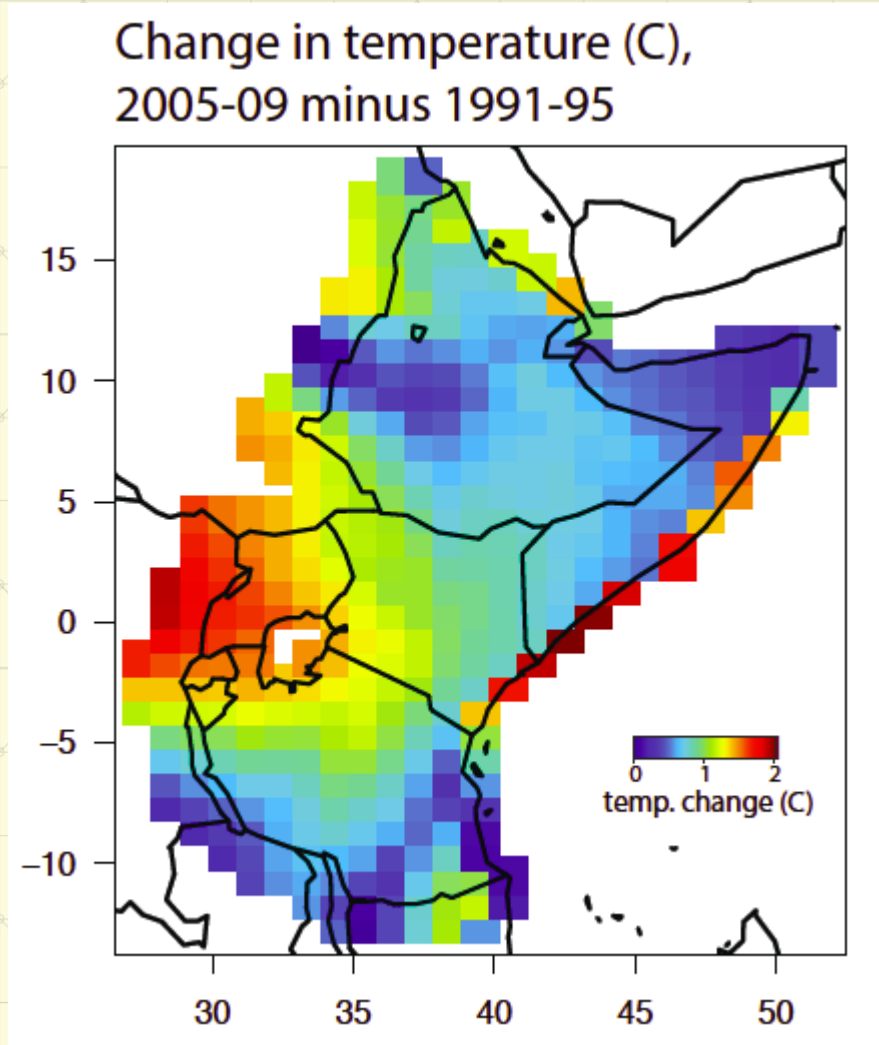
VIOLENT CONFLICT UP 40%

PROJECTED  
TEMPERATURE  
INCREASE (2050)

Standard deviations

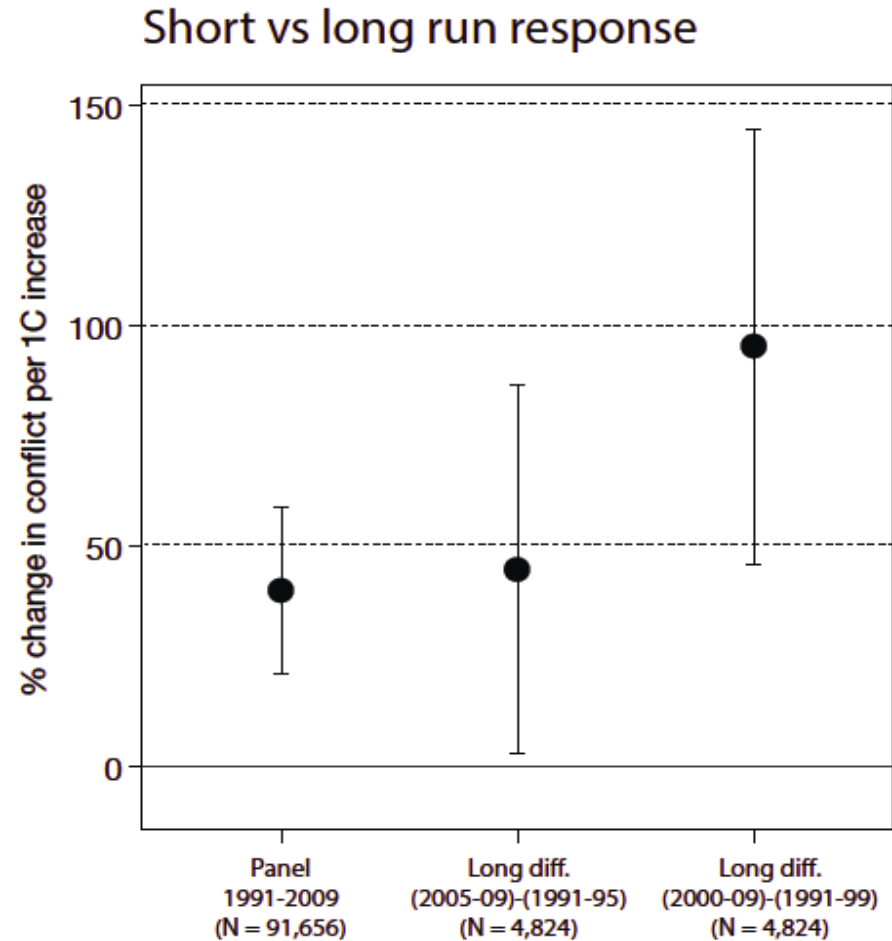


Re-analyzing data  
in O'Loughlin et al.  
(2012, PNAS),  
MINIMAL  
ADAPTATION TO  
WARMING OVER  
20 YEARS



(Source: Burke, Hsiang and Miguel 2015)

Re-analyzing data  
in O'Loughlin et al.  
(2012, PNAS),  
MINIMAL  
ADAPTATION TO  
WARMING OVER  
20 YEARS



(Source: Burke, Hsiang and Miguel 2015)





With global mitigation efforts  
at a standstill, a new climate  
adaptation agenda for Africa  
is desperately needed

E.g., drought-resistant crop varieties,  
weather insurance, foreign aid programs?  
Nunn and Qian (2014, AER) on food aid



