

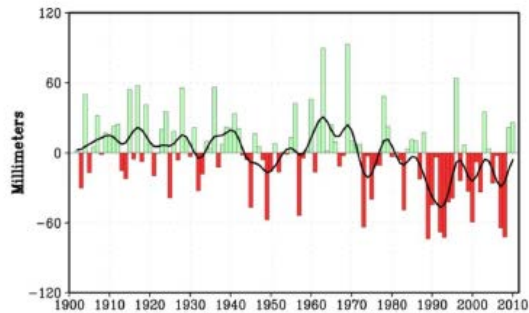
# In Search of Usable Climate-Security Data

WWHGD Workshop on Climate and Security  
Boulder, CO  
3-4 June 2015

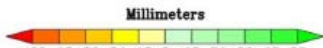
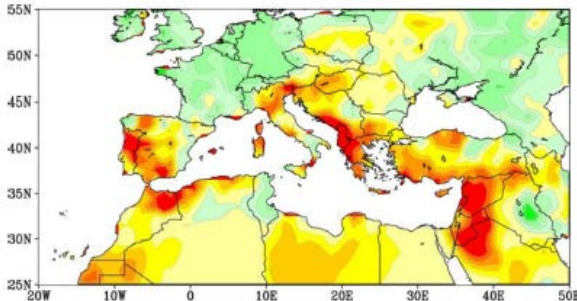
Marc Levy  
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@marc\_a\_levy





Gleick 2014



## Timeline of Events Prior to the 2011 Uprising

### 1970s-1990s

*Agricultural policies promote production of staple crops, leading to increase in number of groundwater wells and use of inefficient and outdated irrigation methods*

Drought (1988-1993)    Drought (1998-2000)



**12 March, 1971**  
*Hafez al-Assad becomes president of Syria*

*Syria achieves self-sufficiency in wheat production*

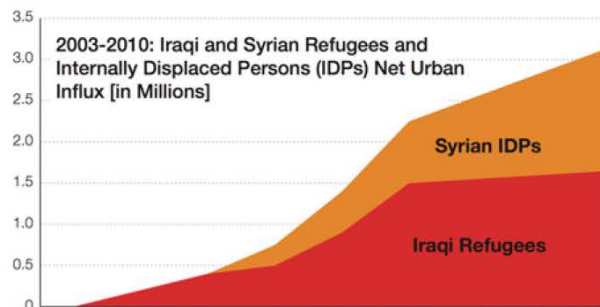
*Drying of the Khabur River in NE Syria*

**Since 2005**  
*Apartment prices in Damascus have more than doubled*

**Winter 2007-08:**  
*Driest in observed record*

**Since 2007**  
*Wheat, rice, and feed prices have doubled*

**March 2011**  
*Uprising in Syria*



Syria civil war  
>220k deaths,  
> 3.3 m refugees

Our latest candidate for a “climate war”

Unprecedented, widespread drought, massive relocation, severe deprivation preceded violent unrest

**Clear in retrospect, but no clear warning provided**

HomeJournal Presents:

# CAN THIS MARRIAGE BE SAVED?™

Time Scales

Complexity

World Views

Obstacles  
abound

Coalitions

Methods

These obstacles explain our failure, but also map out what success requires

# First thing we do, let's synchronize our time scales



- Climate change science is most robust at ~100-year time scale
- Political science studies of insecurity are most robust at ~1-year time scale.

**Logarithmic split-the-difference:  
focus on decadal scale?**

# Food Security Example



**Practical solution to time-scale challenge**

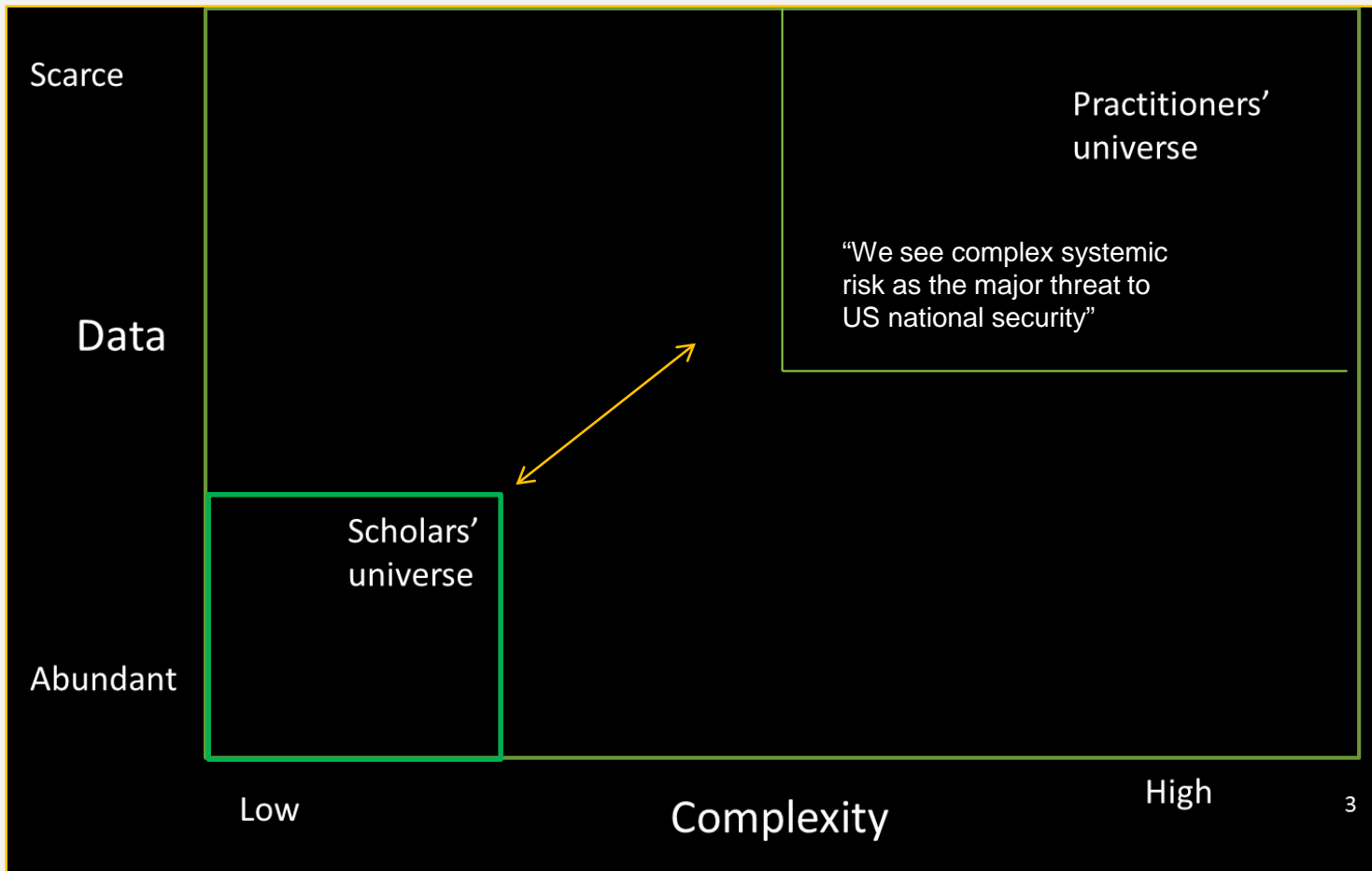
## Extreme weather and resilience of the global food system

Prepared for the UK-US Taskforce on Extreme Weather and Global Food System Resilience

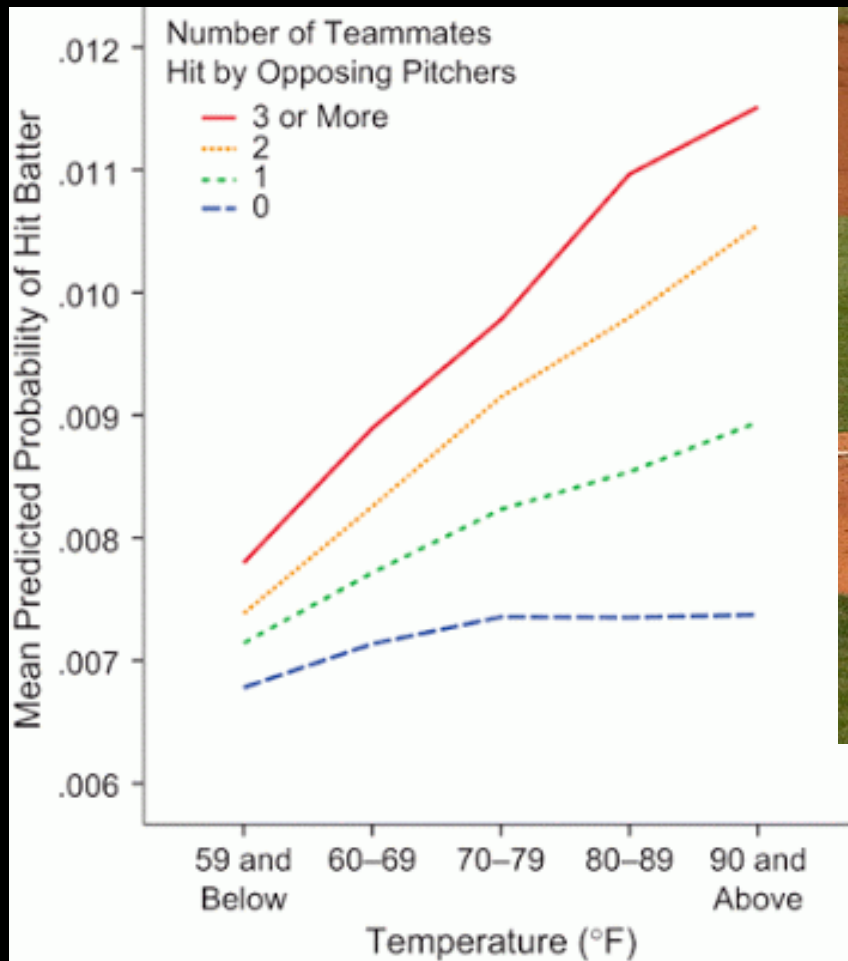
May 2015

*Table 1. Impacts of weather on production of 4 main crops in 1988/9 and 2002/3 (from Annex B)*

CROP	CASE STUDY YEAR	% GLOBAL PRODUCTION DECREASE	ABSOLUTE PRODUCTION LOSS (MILLION TONNES)	MODELLED YIELD LOSS FROM GGCMi (%)
MAIZE	1988	12%	55.9	13.5-16.4
SOYBEAN	1988/89	8.5%	8.9	6.0-6.3
WHEAT	2003	6%	36.6	6.4-9.5
RICE	2002/03	4%	21.7	1.9-3.5

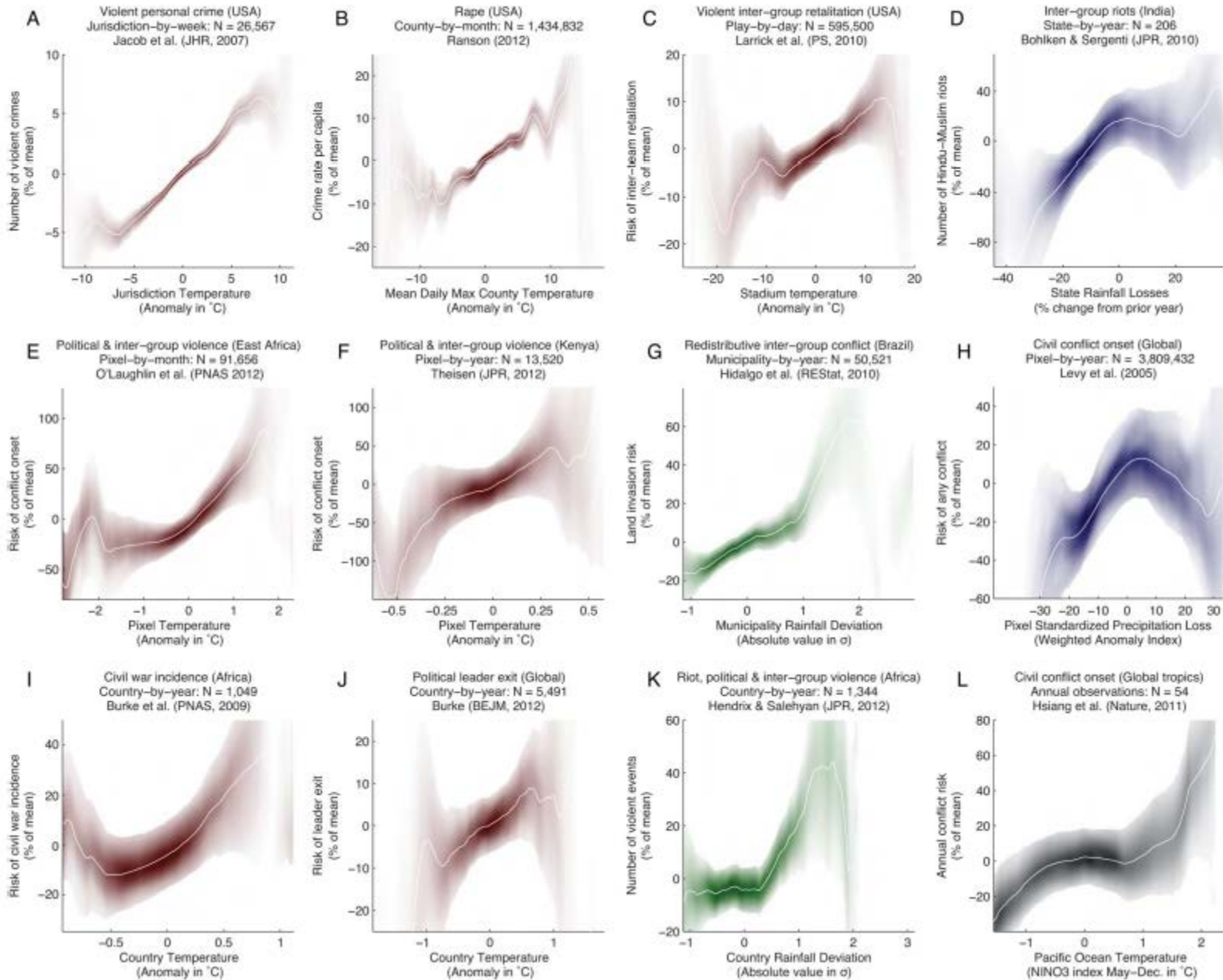


**Search for usable data requires both communities moving out of their comfort zones**



**Evidence from many quarters that climate extremes make it harder to regulate violence**

Larrick et al, 2011 HT Solomon Hsiang



Red = T  
Green = Anomaly  
Blue = P deficit

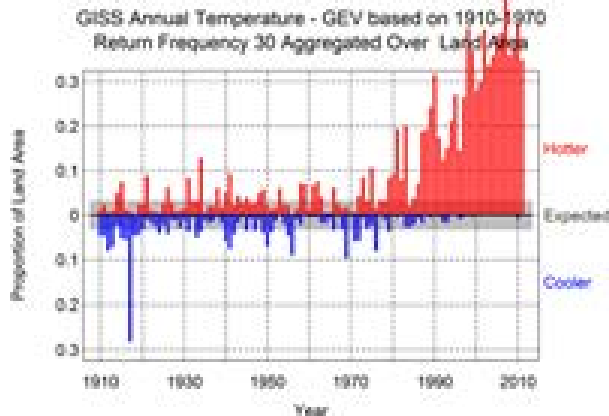
These are effects  
net of country  
circumstances

Hsiang et  
al 2013



# This is very bad news

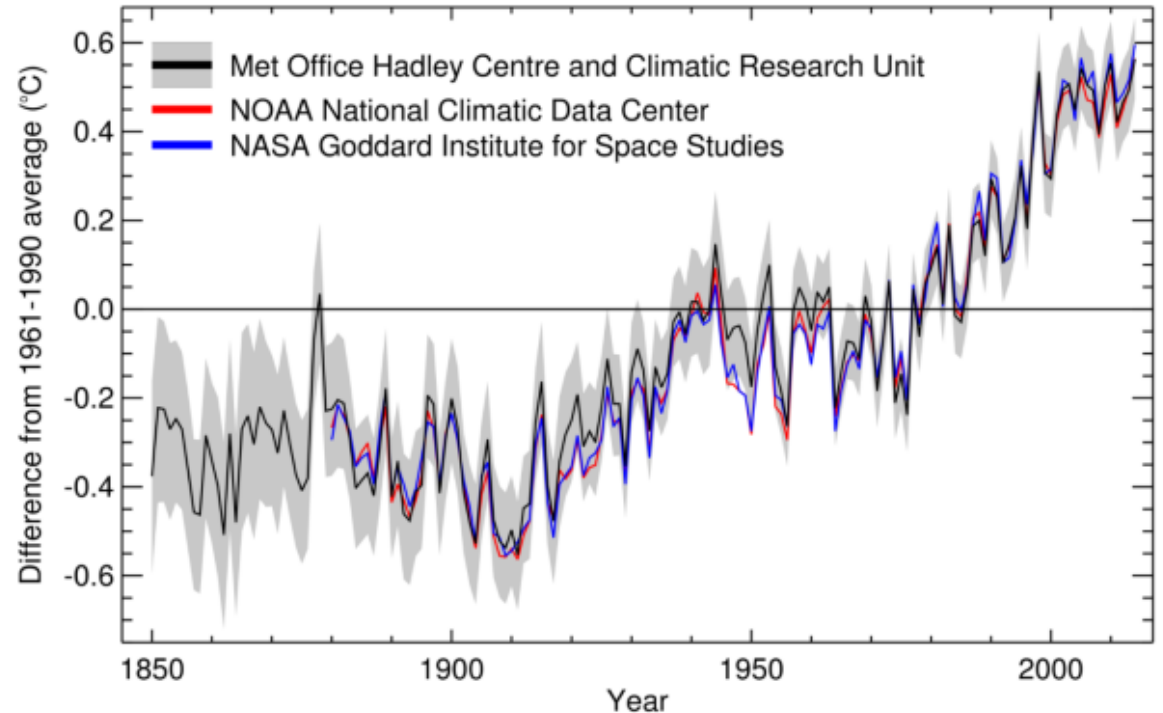
## 1910-1970 Baseline



McElroy and Baker 2012

The climate stress that historically doubled conflict risk is now much more common

## Global average temperature anomaly (1850-2014)

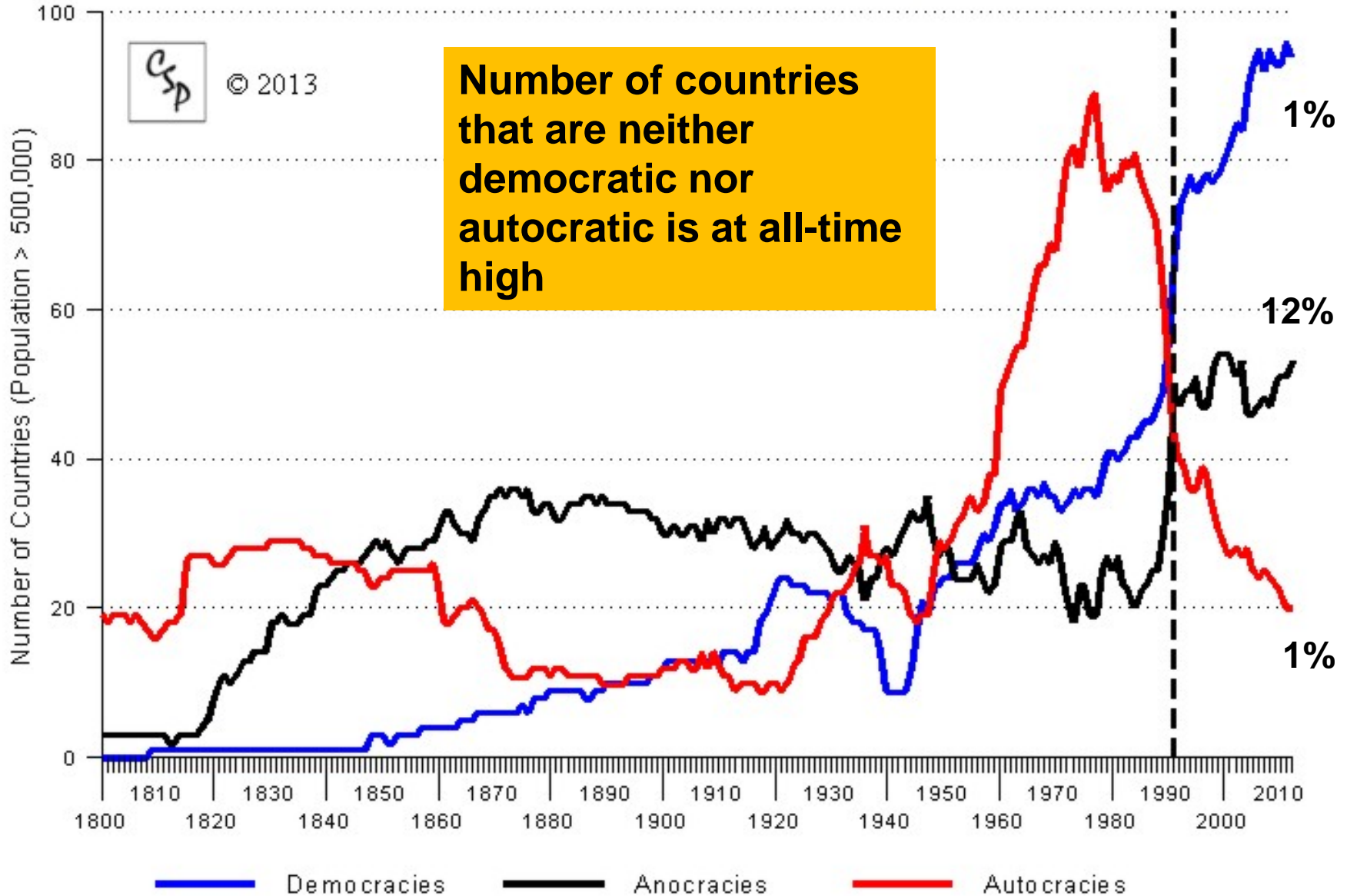


Global average temperature anomaly 1850-2015. Image: WMO.  
Image 1 of 3

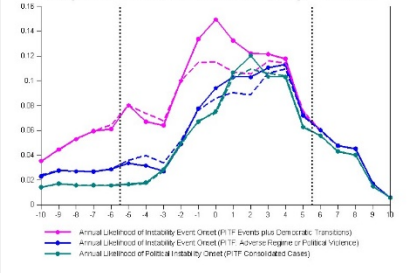
CLOSE X

WMO

# Global Trends in Governance, 1800-2012

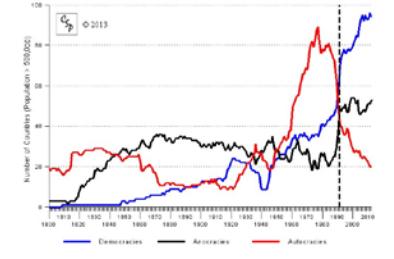


Polity and the Onset of Political Instability, 1955-2006



X

Global Trends in Governance, 1800-2012



Risk-Denominated Polity Score

6.00  
5.00  
4.00  
3.00  
2.00  
1.00  
0.00

1800 1850 1900 1950 2000 2050

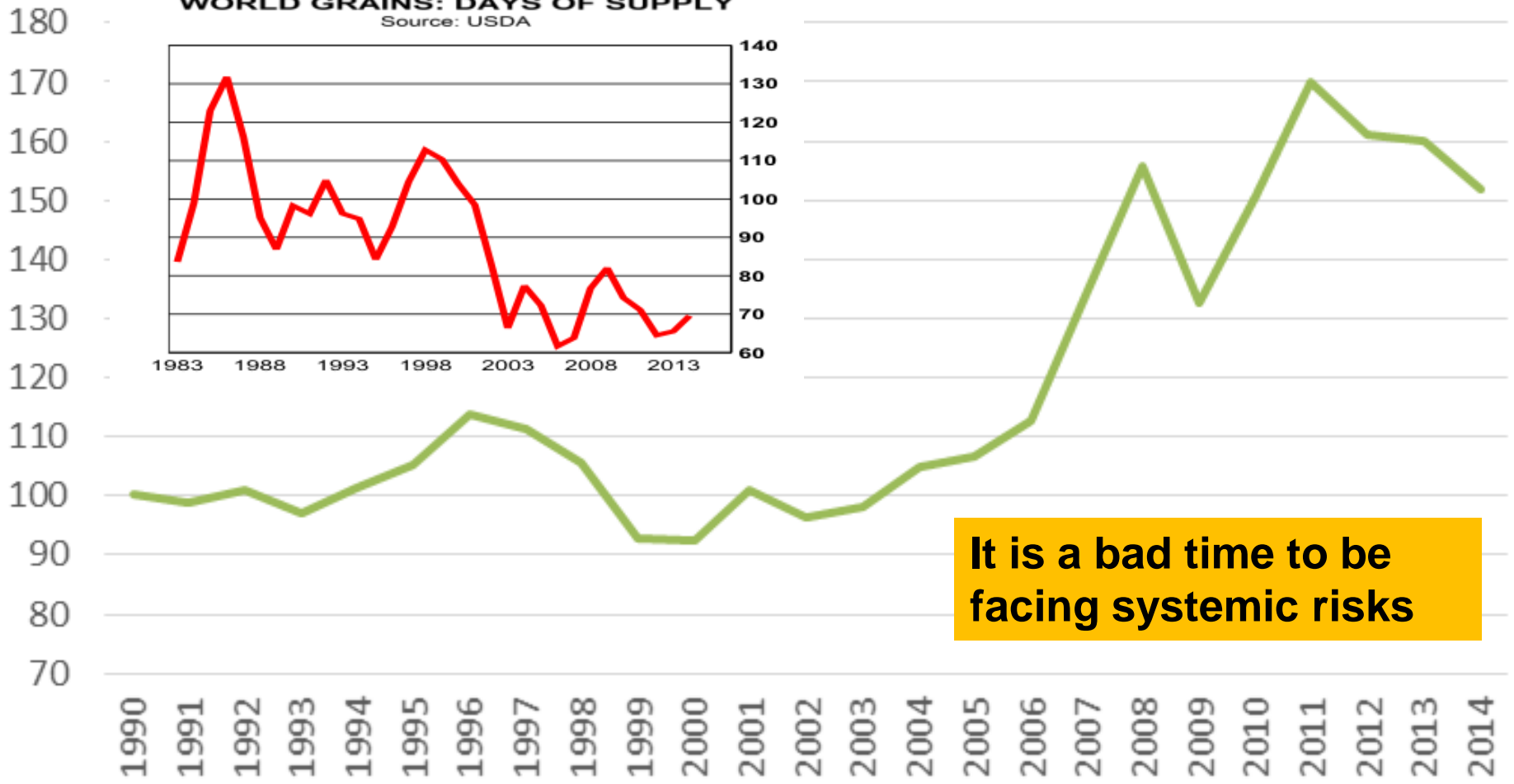
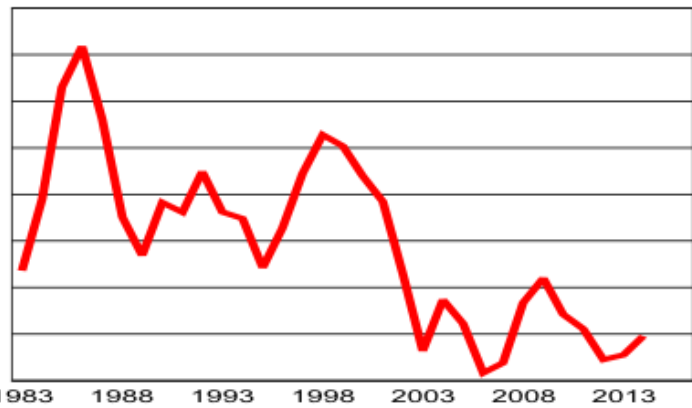
Year

**Democratization trend, replotted as instability risk**

# FAO Food Price Index (Real)

## WORLD GRAINS: DAYS OF SUPPLY

Source: USDA



**It is a bad time to be facing systemic risks**

**Globalization and political fragmentation yield little resilience, few tools.**

# Russia, Crippled by Drought, Bans Grain Exports



Natalia Kolesnikova/Agence France-Presse

Russians fought a fire near the village of Golovanovo, in the Ryazan region of Russia on Thursday. More Photos by ANDREW KRAMER

**Efforts to manage climate extremes can shift risk to others (security dilemma)**

## EGYPT: Fears of a food crisis after Russia's wheat export ban

AUGUST 8, 2010 | 8:44 AM

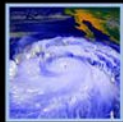
Russia's decision to **ban** grain exports is fueling anxiety among Egyptians that an international wheat crisis could lead to massive food shortages in the Arab world's most populous country.



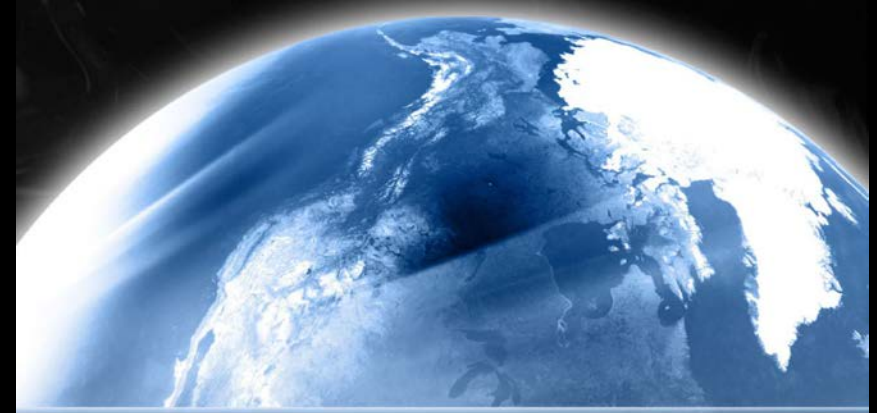
Egypt is the world's top wheat importer, annually buying 6 million to 7 million tons from the international market. About 50% of that comes from Russia. However, record high heat, accompanied by wildfire and **drought**, has forced Moscow to abandon its



## CLIMATE EXTREMES: RECENT TRENDS WITH IMPLICATIONS FOR NATIONAL SECURITY



McElroy and Baker 2012



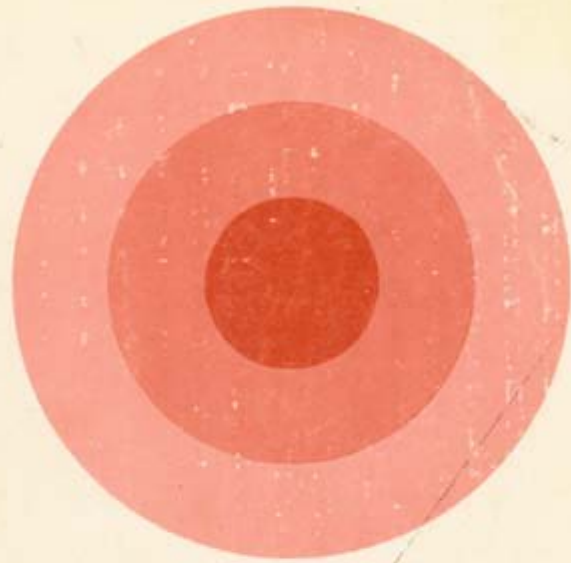
## CHANGING CLIMATE: IMPLICATIONS FOR SOCIETAL DISRUPTION



Levy 2012

- Parallel working groups / physical and social science
- Overlapping membership and united leadership
- Close, sustained interaction with client.
- Both took pains to identify set of syndromes or archetypes of risk that could emerge over the course of a decade

# Worldviews



**KARL A. WITTFOGEL**  
**ORIENTAL**  
**DESPOTISM**  
**A COMPARATIVE STUDY OF TOTAL POWER**

1957

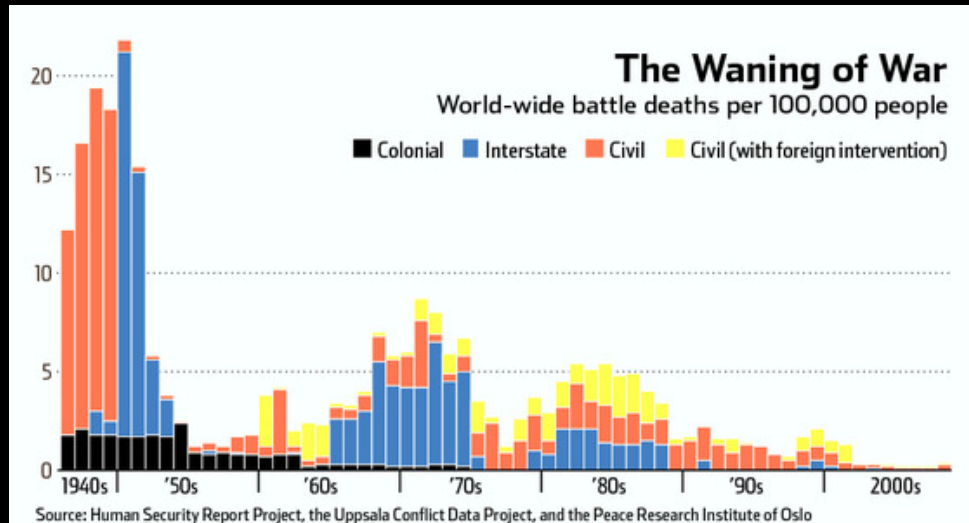
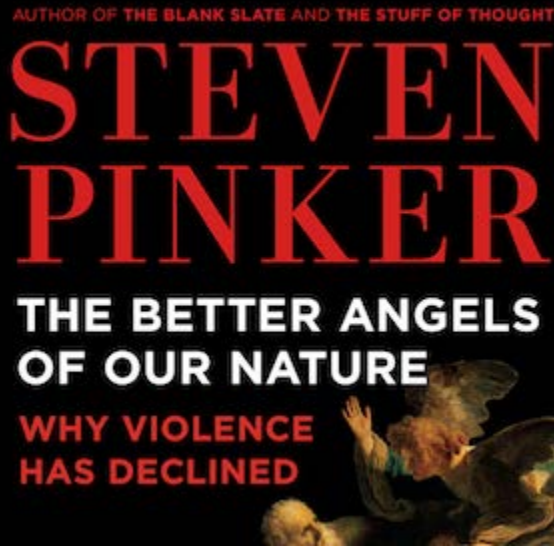
# Fears of environmental determinism and racism



1) We went too far in rooting out objectionable views. Geography does matter!

2) This is not your father's environmental determinism.

We thought things were going so well



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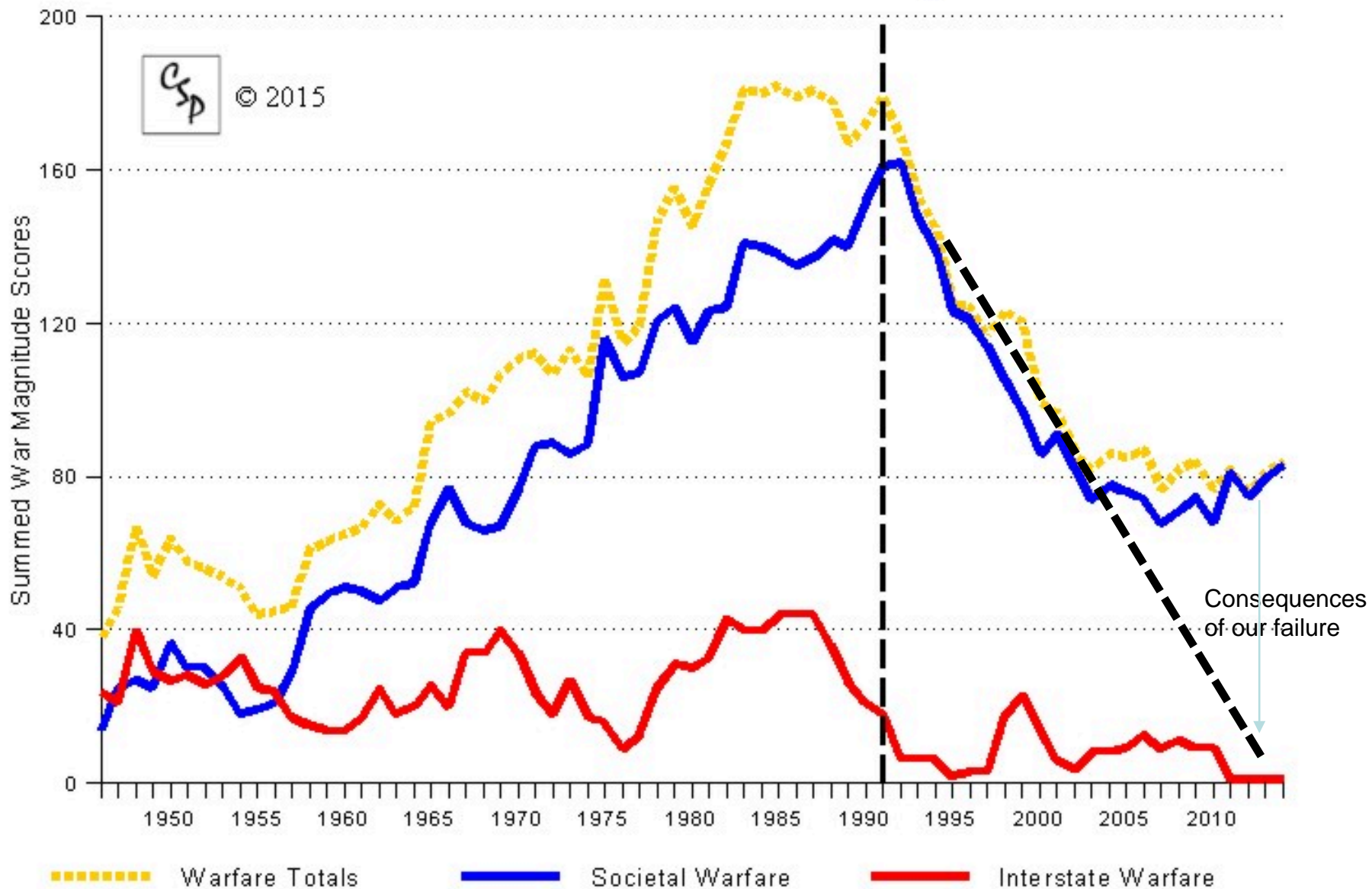
[PRESS ROOM](#)



Since 1989, there has been an upsurge in international efforts to ensure a more secure world



# Global Trends in Armed Conflict, 1946-2014



# Taking this seriously makes for awkward coalitions

Intelligence

Military

Science

Humanitarian

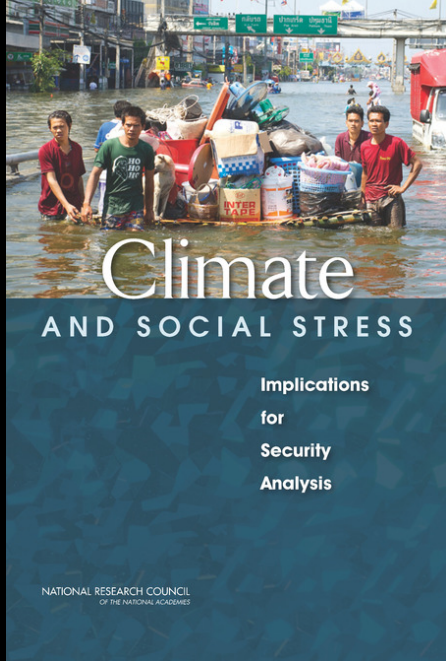


Acknowledge it, and deal with it

Build on successes

Plan new actions

If old structures don't work, create new ones



John Steinbruner,  
1941-2015

Don't pretend that currently dominant tools and methods will answer our questions.

Inertia drives investment in integrated assessment models, in predictive conflict models, but innovations languish.

## AN APPROACH TO ANTICIPATING RISKS

*Recommendation 6.3: The intelligence community should establish a system of periodic “stress testing” for countries, regions, and critical global systems regarding their ability to manage potentially disruptive climate events of concern. Stress tests would focus on potentially disruptive conjunctions of climate events and socioeconomic and political conditions.*

# CHANNEL GUIDE

9:10 AM



		10:00 AM	10:30AM	11:00AM	11:30AM	12:00PM
501	<b>FEAR</b>	Violence (MA)	Instability	Climate Change	Water Scarcity	Resource Wars
502	<b>DATA</b>	Event-coding	Satellites	Crowd-sourcing	Big-Data	
503	<b>ACTION</b>	Peacekeeping	Investment	Insurance	Humanitarian Response	Resource Management
504	<i>FUSION</i>	Early Warning	Program Design	Rapid Response	Risk Assessment	Community Empowerment

**People want better data. But that's not enough. Devote attention to time scales, complexity challenges, world view problems, awkward coalition issues, and appropriate methods.**

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