

# National Security and Climate Change GENI Center

January 20, 2015

Len Hering, RADM, USN (ret), Executive Director

Accelerating the transition to a sustainable world powered by clean energy



# CSE Mission: Accelerate the transition to a sustainable world, powered by clean energy



Center for  
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02



## 3 Reasons for a Sustainable Future

*What are yours?*



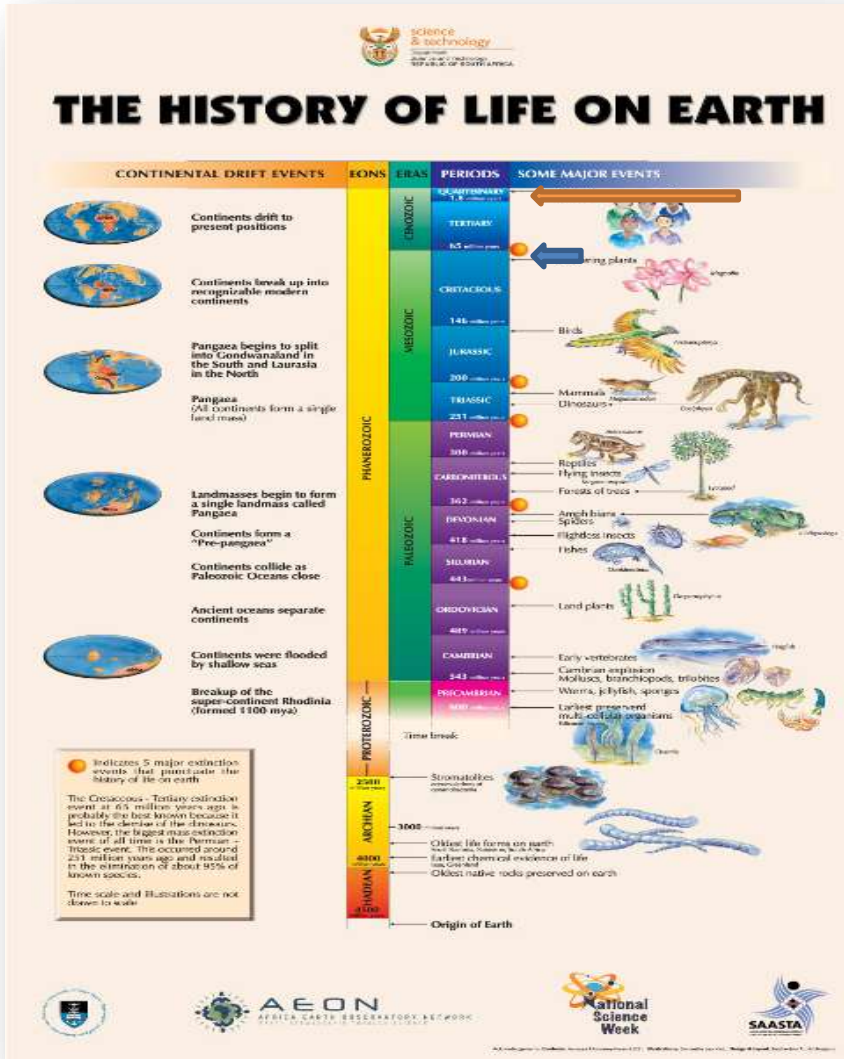
How sustainable are we?

*Is a peaceful future possible if we accept the facts?*



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# Placing things in perspective



***If this scale represented an entire year of time (365 days or 525,600 minutes) man has been on the face of the earth for less than a one quarter of 1 minute!***



# A 360 Degree View

*“There is nothing happening.”*

*“We don’t know why it’s happening.”*

*“Climate change is natural.”*

*“Climate change is not bad.”*

*“Climate change can’t be stopped.”*

*“It’s never effected us before, we’ll be able to figure it out as we go, we always have, nothings different.”*

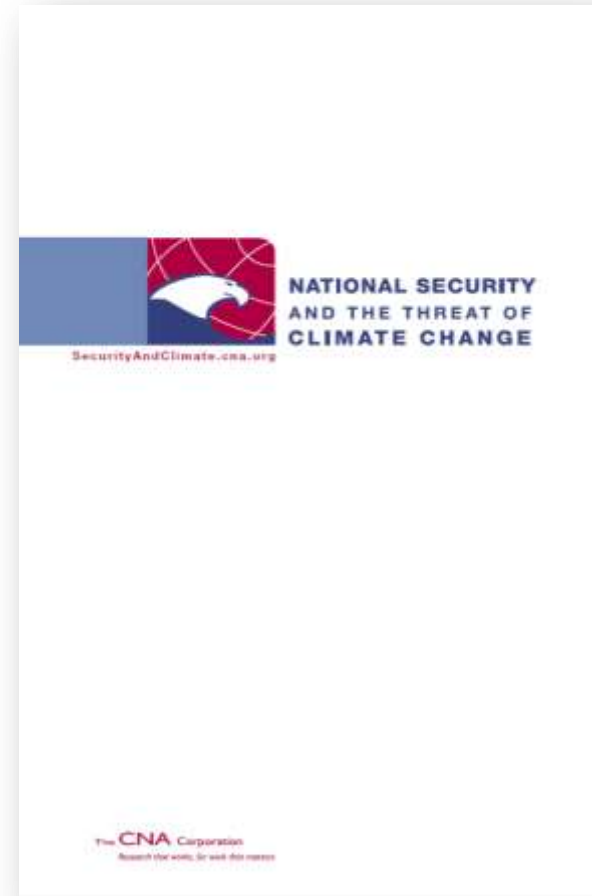
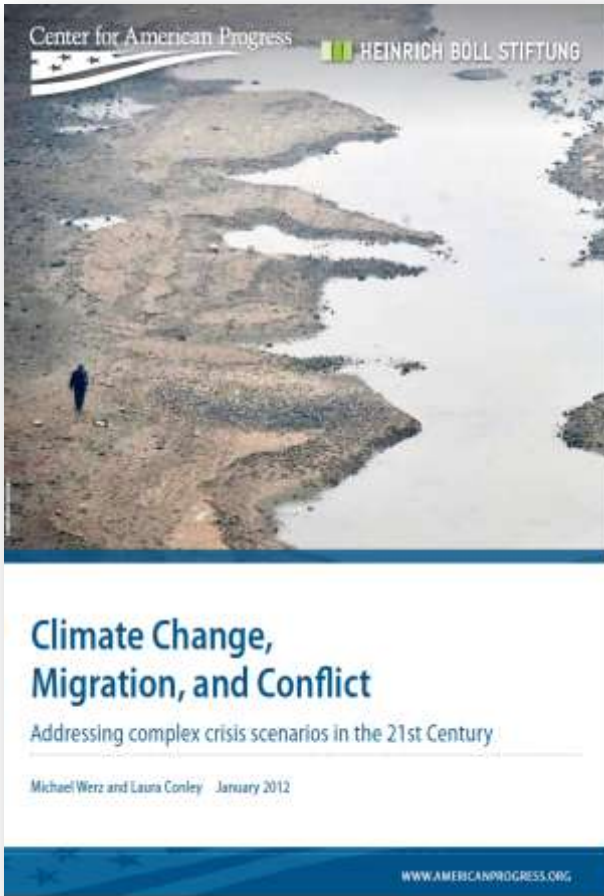
*“We’ve dealt with this type of situation for centuries and man has always won.”*

*Climate change  
is the biggest  
long-term  
security threat in  
the Pacific  
region.”*

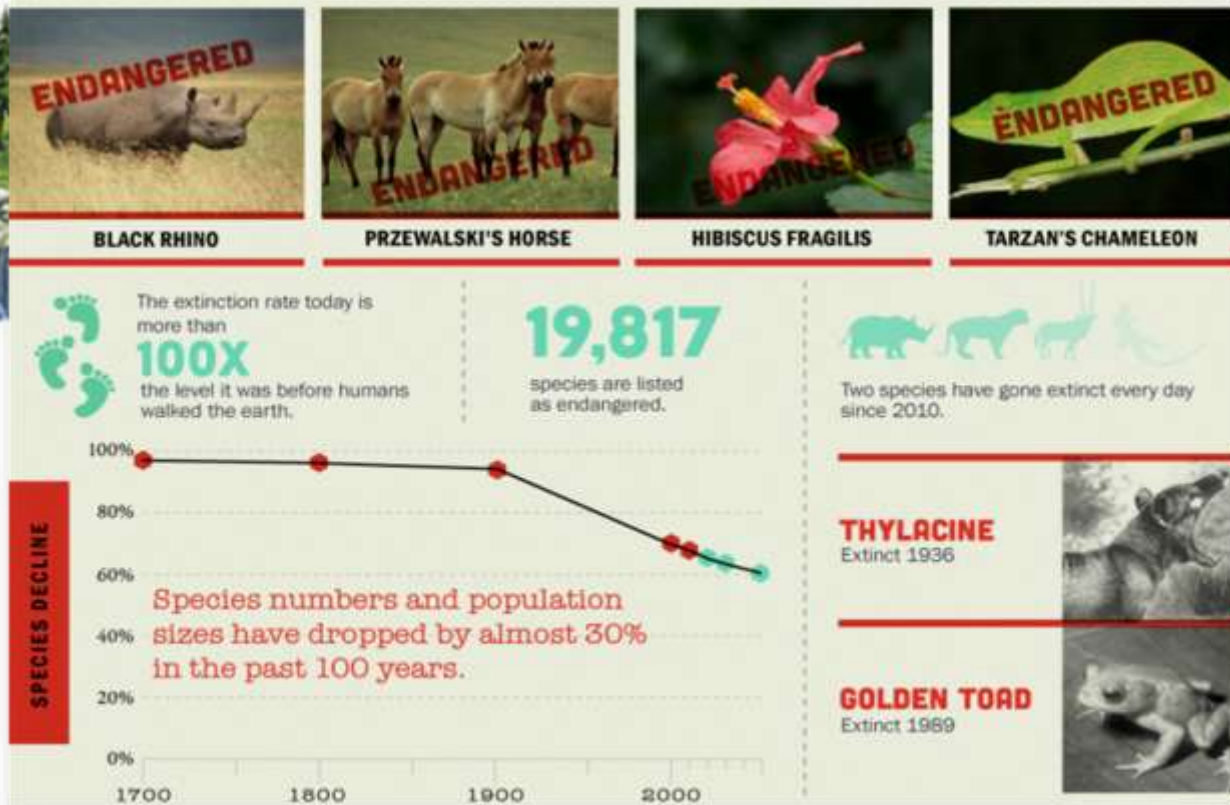


Admiral Sam Locklear, Commander U.S. Pacific Command

# *Experts Agree, it's not if, it's when.*







# Mankind and Nature

a

## GLOBAL LOSS OF SEAFOOD SPECIES

% of sp

State of the Oceans

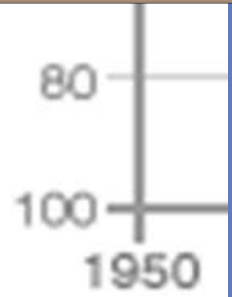
85% of fisheries fully exploited,

70% of the worlds population gets its protein from the sea!

b

250,000 square miles of dead zones

If better managed, the production value of fisheries could increase from \$120 billion to \$900 billion



Years

SOURCE: Science/FAO

News / World

## South China Sea: Open conflict a real possibility due tensions over fishing and other resources, says report

Conflict feared between China and countries in the South China Sea as the battle for fishing stocks, oil and gas deposits escalates

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AP

Chinese fishing boats sail in the South China Sea, an area at the centre of a dispute among several countries.

VELLAPALLAM JOURNAL

## Two Hungry Nations Collide Over Fishing



Kuni Takahashi for The New York Times

Embarking from Vellapallam, India. "This is risky work," one fisherman said. "But we don't have any other skills. We are illiterate. We are poor."

By JIM YARDLEY

Published: September 4, 2012

VELLAPALLAM, India — Drifting on the strait between India and [Sri Lanka](#), an Indian fisherman named Sakhivel covered in his boat. A Sri Lankan naval officer, who took the man's photograph, delivered a warning: If we find you in Sri Lankan waters again, you will never leave.

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## *Mankind's waste baskets*



## *Chollas Creek 2000*



*80 tons of waste*

# World Population Growth

billions

10

8

6

4

2

0

1750

1800

1850

1900

1950

2000

2050

According to United Nations projections, the number will rise to 9.3 billion by 2050 — the equivalent of adding another India and China to the world.



World  
Resources  
Institute

Sources: United Nations Population Division and Population Reference Bureau, 1993.

Popu



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## Human tide: the real migration crisis.

FULL TEXT

**Author:** Baird R; Migiros K; Nutt D; Kwatra A; Wilson S; Melby J; Pendleton A; Rodgers M; Davison J

**Source:** London, United Kingdom, Christian Aid, 2007 May. 50 p.

**Abstract:** The number of IDPs is expected to rise dramatically in the coming decades. And those already displaced look likely to be joined by at least equal numbers of people forced from their homes because of climate change. The case studies in this report spell out in human detail how major internal migration crises, caused by conflict, have already developed in Sudan, in Uganda and in Sri Lanka. The authors seek to highlight how these devastating situations are still developing with far less attention from the world's media or the wider international community. They illustrate how, over time, internal displacements with their roots in conflict can mutate into disputes over land and other economic resources or hard cash. Case studies of Colombia, Burma and Mali are also presented. The report highlights how solutions must start with an overhaul of the current UN system for dealing with internally displaced people. In addition it highlights that the growing problem of displacement resulting from large scale development programmes must also be addressed. Finally the authors argue that governments of rich states, such as the UK, must accept their countries' responsibility for the growing harm and suffering that climate change will bring to developing countries and pay to alleviate it. The following issues are addressed: the hidden crisis of internal displacement; the bleak outlook of climate change; in Colombia: conflict and commerce; in Burma: war, dams and power; in Mali: heat, dust and climate change.

**Language:** [English](#)

**Year:** [2007](#)

**Region / Country:** [South America](#) | [Americas](#) | [Asia Southeastern](#) | [Asia](#) | [Africa Western](#) | [Africa Sub Saharan](#) | [Africa](#) | [Colombia](#) | [Myanmar](#) | [Mali](#)

**Keywords:** [Summary Report](#) | [Migration](#) | [Internally Displaced Persons](#) | [War](#) | [Climate](#) | [Changes](#) | [Developing Countries](#) | [Population Dynamics](#) | [Demographic Factors](#) | [Population](#) | [Settlement and Resettlement](#) | [Political Factors](#) | [Sociocultural Factors](#) | [Environment](#) | [Social Change](#)

**Document Number:** 371016



## In Northern Africa, Climate Change Could Make A Current Refugee Crisis Even Worse

BY CLIMATE GUEST CONTRIBUTOR POSTED ON MAY 31, 2012 AT 11:30 AM



117

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Food Sup  
Excess taken



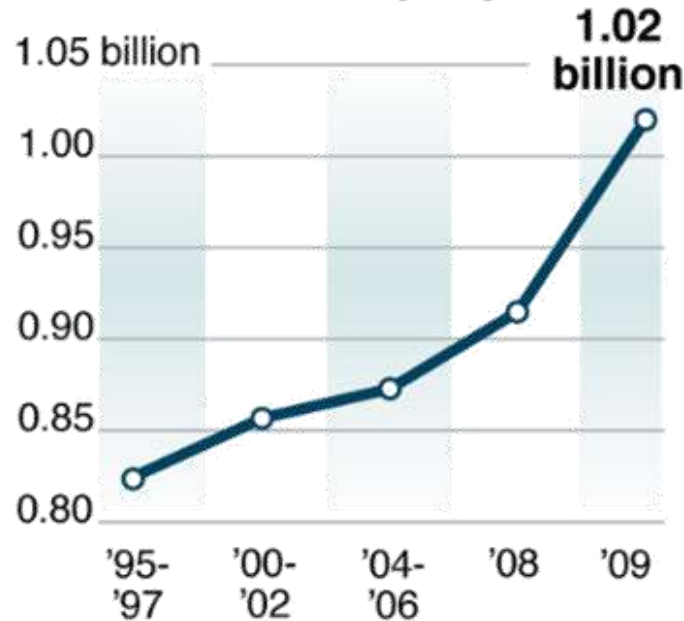
40%

Americans are throwing away 40% of food in the U.S. each year

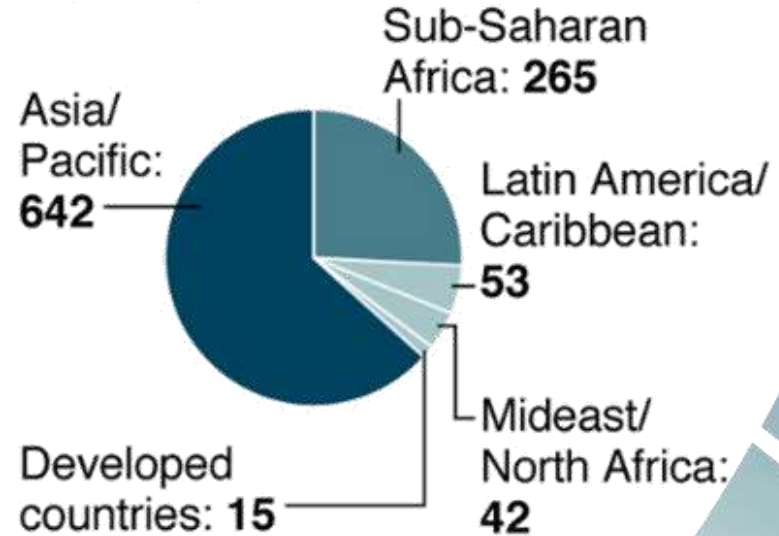
# Global hunger on the rise

The number of undernourished people in the world surpassed 1 billion, according to a U.N. report released Wednesday.

## Undernourished people




## Regional breakdown In millions



SOURCE: Food and Agriculture Organization of the United Nations

AP



If we are to feed this massive population expansion we're going to have to produce more food in the next 40 years than we have the last 10,000.

(UNHCR/WFB 2013)

## The Wait for Food Abroad

*Been there, seen it, it's real and it is heart wrenching.*

## Horn of Africa Drought: Climate change and future impacts on food security

**East Africa is facing the worst food crisis of the 21st Century.** Across Ethiopia, Somalia, and Kenya, 12 million people are in dire need of food, clean water, and basic sanitation. Loss of life on a massive scale is a very real risk, and the crisis is set to worsen over the coming months, particularly for pastoralist communities.

It is no coincidence that the worst affected areas are those suffering from entrenched poverty due to marginalization, conflict and lack of investment. While severe drought has undoubtedly led to the huge scale of the disaster, this crisis has been caused by people and policies, as much as by weather patterns. An adequate response to the current crisis must not only meet urgent humanitarian needs, but also address these underlying problems.

### Downloads



briefing-hornofafrica-drought-climatechange-foodsecurity-020811\_3.pdf  
210.38 KB

### About this paper

Author:

Post date: 3 August 2011

Country: SomaliaEthiopiaKenya



## Food Policy

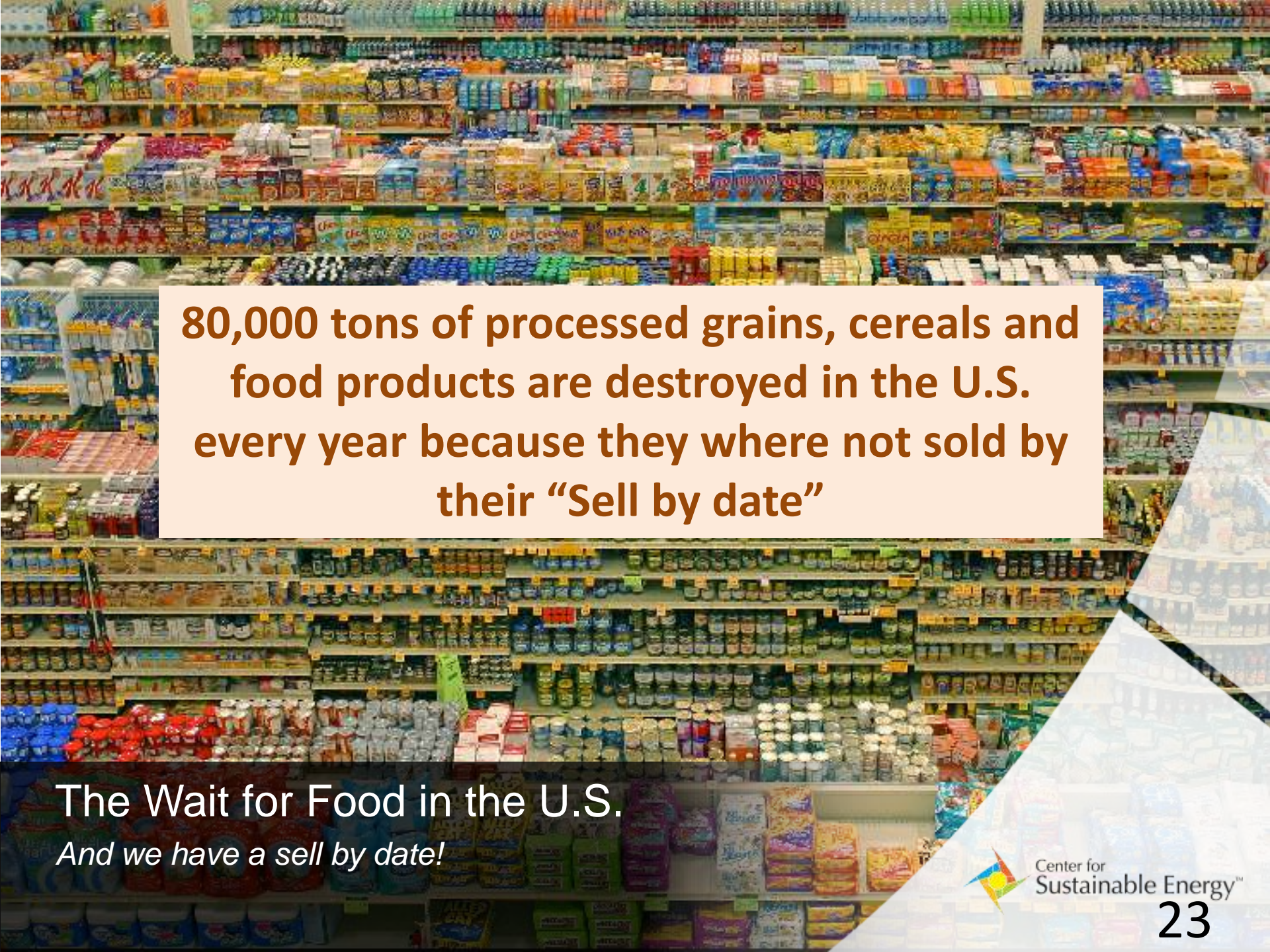
Volume 35, Issue 5, October 2010, Pages 365–377



### Global water crisis and future food security in an era of climate change

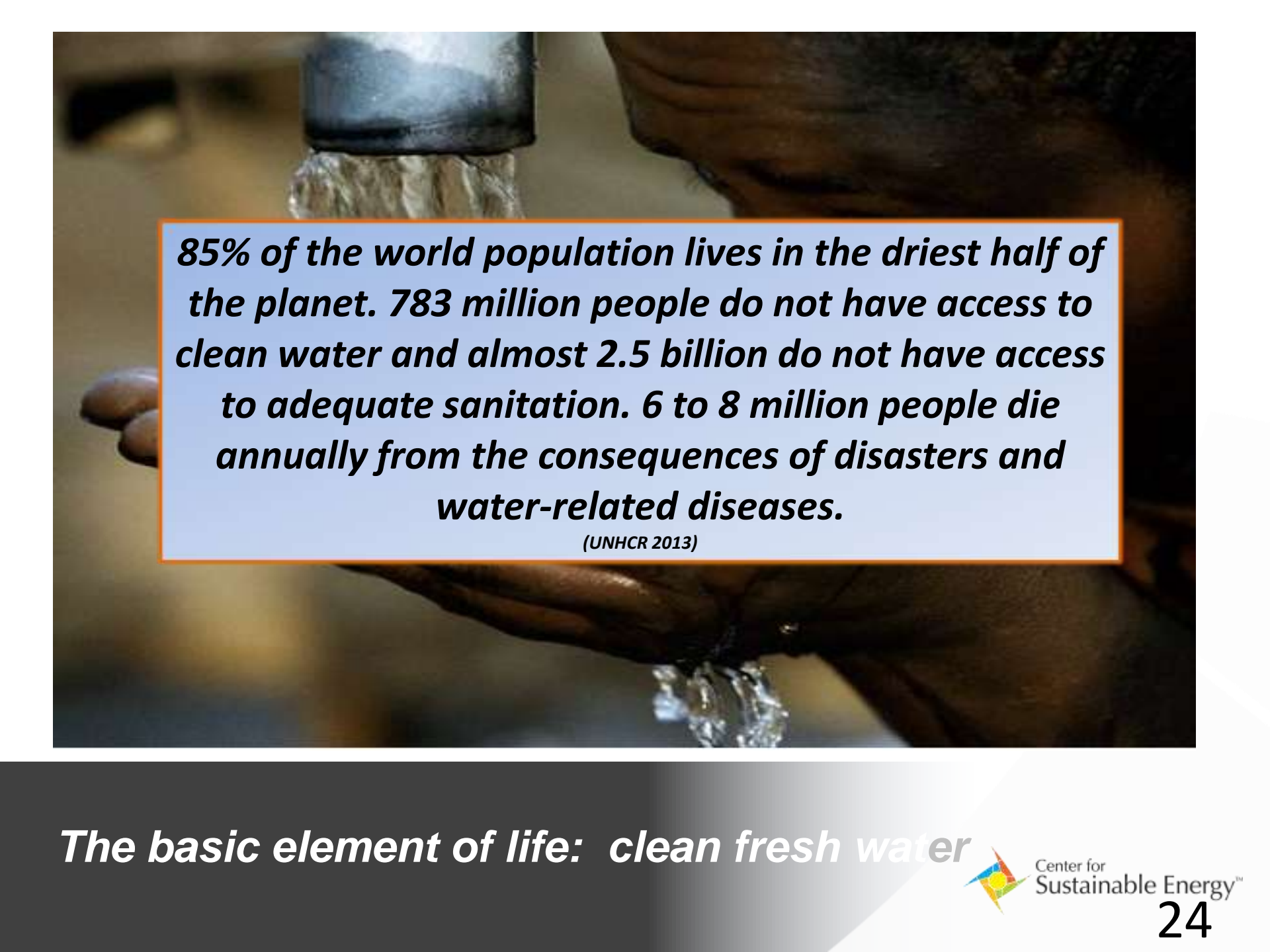
Munir A. Hanjra<sup>a</sup>, M. Ejaz Qureshi<sup>b, c</sup>

[+ Show more](#)



**80,000 tons of processed grains, cereals and food products are destroyed in the U.S. every year because they were not sold by their “Sell by date”**

**The Wait for Food in the U.S.**  
*And we have a sell by date!*



***85% of the world population lives in the driest half of the planet. 783 million people do not have access to clean water and almost 2.5 billion do not have access to adequate sanitation. 6 to 8 million people die annually from the consequences of disasters and water-related diseases.***

*(UNHCR 2013)*

***The basic element of life: clean fresh water***



# Things are Bad and Getting Worse



Alarm bells toll for human civilization as world's 12th largest mega-city to run out of water in just 60 days



Wednesday, December 03, 2014  
by Mike Adams, the Health Ranger

Tags: [mega-cities](#), [water supply](#), [human civilization](#)



## *Devastation on a grand scale*

**Australian farmers are forced to make a difficult decision.  
10,000+ animals are left in the field to die.**



**“If water allocations are not rebalanced and restored to California, 35% of the states dairy farms may be forced to close in 2015.”**



# Climate change could lead to China-India water conflict

Last updated on 11 June 2014, 7:44 am

Decline in water flow from Tibetan Plateau likely to exacerbate tensions in region over coming decades



Water draining from the Himalaya glaciers sustains around 40% of the world's population (Pic: UN Photos)

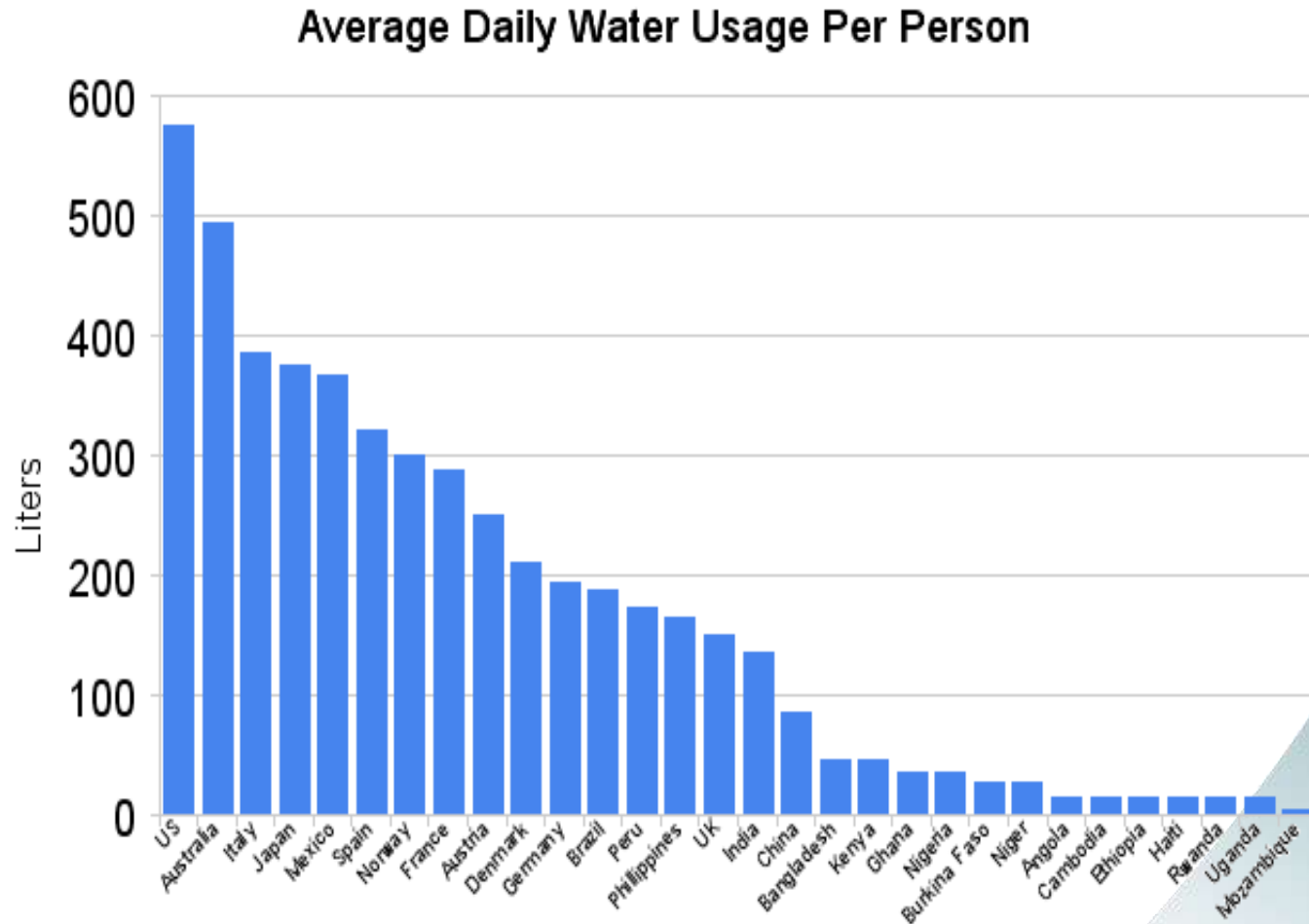
By [Ed King](#)

Melting Himalayan glaciers and erratic rainfall could exacerbate tensions between central Asian countries later this century, warn defence analysts in a [new report](#).

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Email 1

Want To  
Sell Cheap  
China Goods  
For Profit?

# U.S. Wastes 7 Billion Gallons of Drinking Water Daily



# Texas Drought Drives Uptick In Water Rights Disputes

By Jess Davis

Law360, Dallas (December 09, 2013, 7:47 PM ET) -- Litigation and administrative challenges over Texas surface water rights, on the rise in recent years, are expected to ramp up as the ongoing statewide drought and booming population force stakeholders to test the boundaries of how their water is allocated, experts say. It's no secret that water has quickly become one of the scarcest natural resources and a source of contentious battles in recent years, with competing claims for limited water coming from industrial users, farmers and ranchers, cities and environmental advocates. Though Texas voters in November **approved a \$2 billion investment fund** that a revamped state water board hopes will **improve conditions** and create solutions to some of the water shortages, in parts of the state today, there's not enough to go around.

# WARS BETWEEN THE STATES IN THE 21ST CENTURY: WATER LAW IN AN ERA OF SCARCITY

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*Stephen E. O'Day,\* Jessica Lee Reece, & Josie Krause Nackers\*\**

Vermont Journal of Environmental Law 2013 Vol. X

# Extreme weather

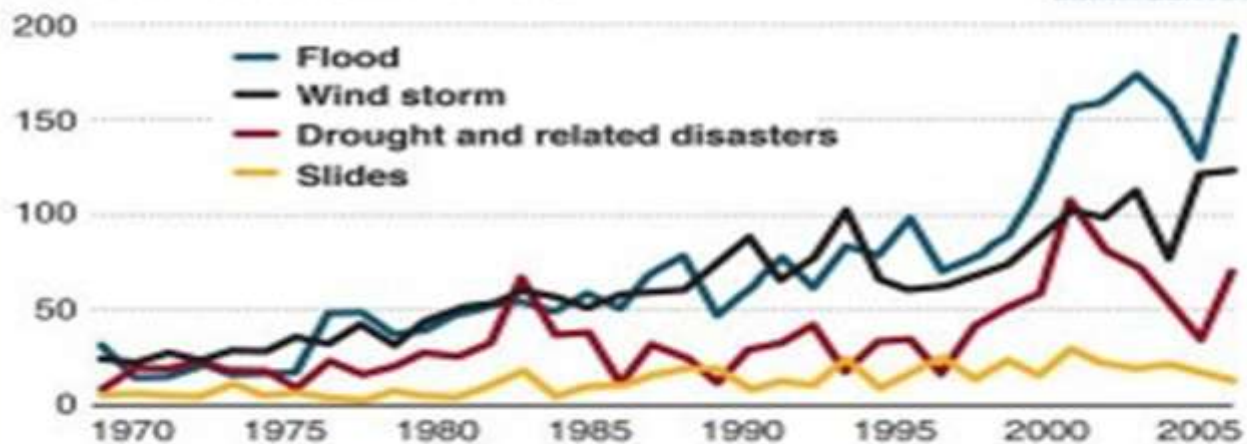
*Number of floods has risen sharply due to climate changes.*



COP15  
COPENHAGEN

## Trend in extreme weather events 1970-2005

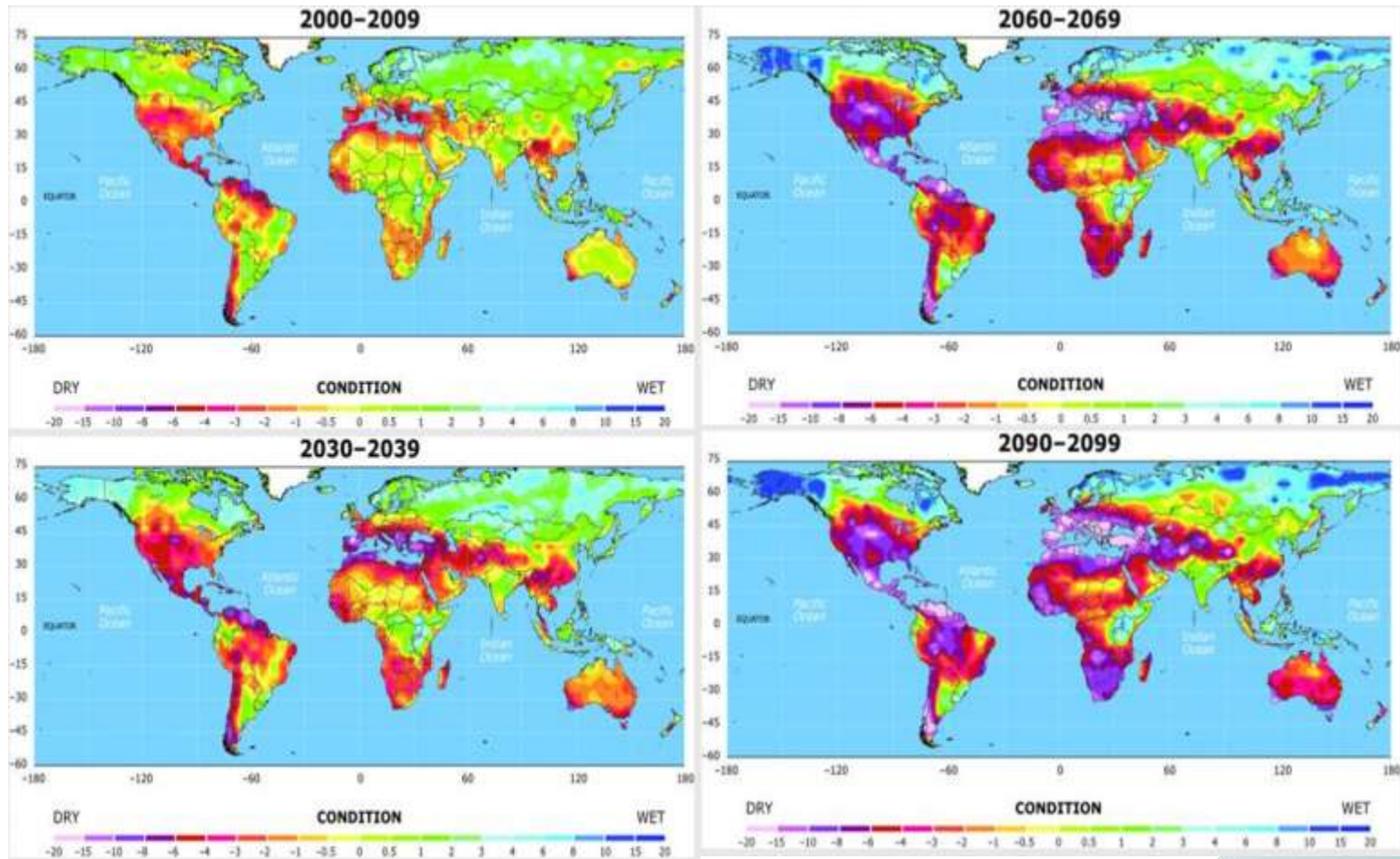
Number of disasters in the world



Source: United Nations International Strategy for Disaster Reduction 2009  
Graphic: Jutta Scheibe, Eeli Poili

© 2009 MCT

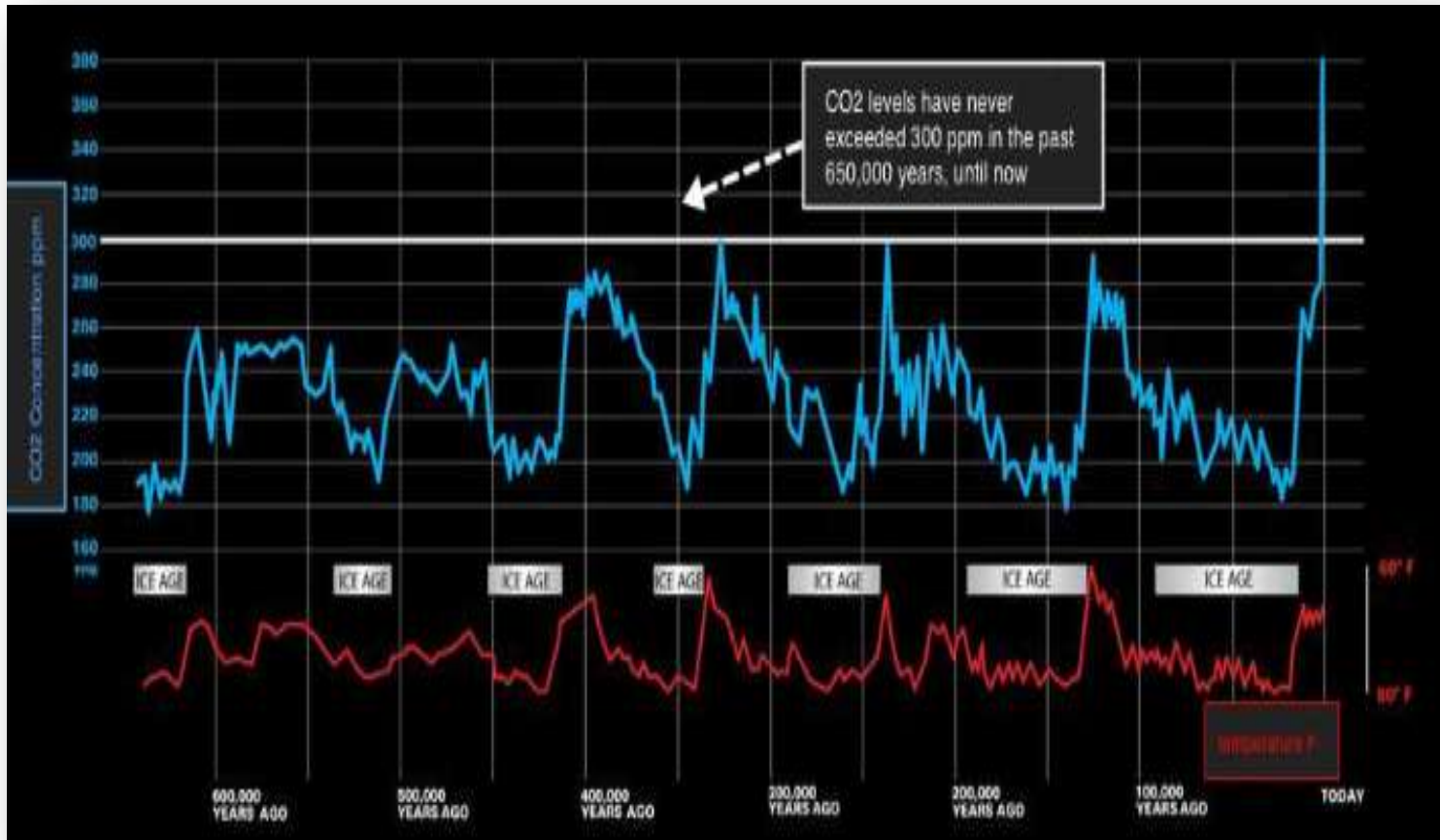
# *NASA predicts it's not going to change anytime soon*



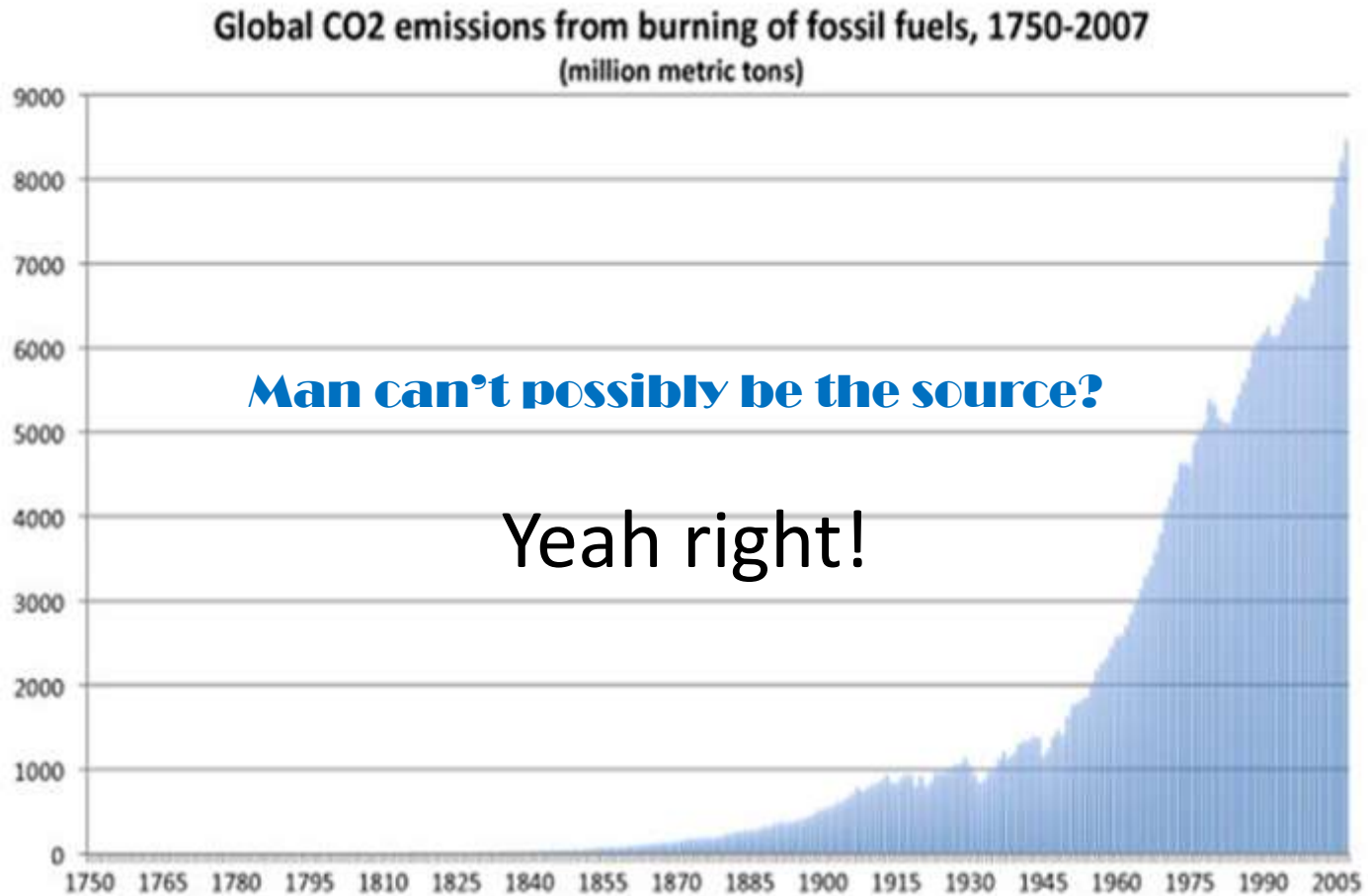
Wet regions will be wetter and dryer regions will become more arid.



# Unprecedented territory

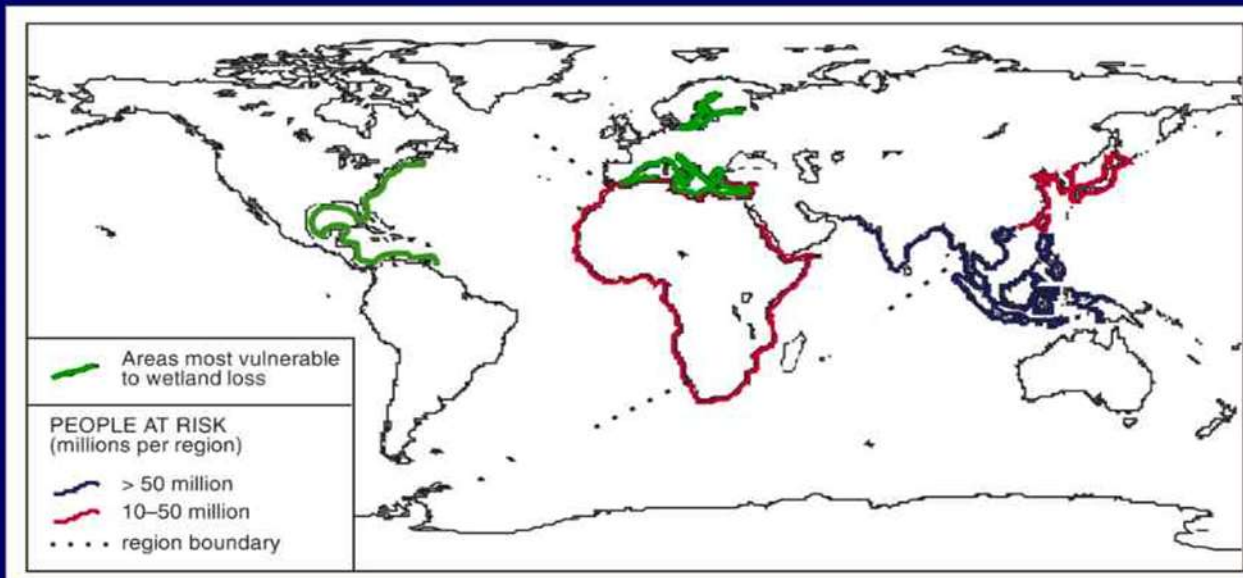


# *Seems strange when you look at the data*



# People at Risk from a 44 cm sea-level rise by the 2080s

Assuming 1990s Level of Flood Protection

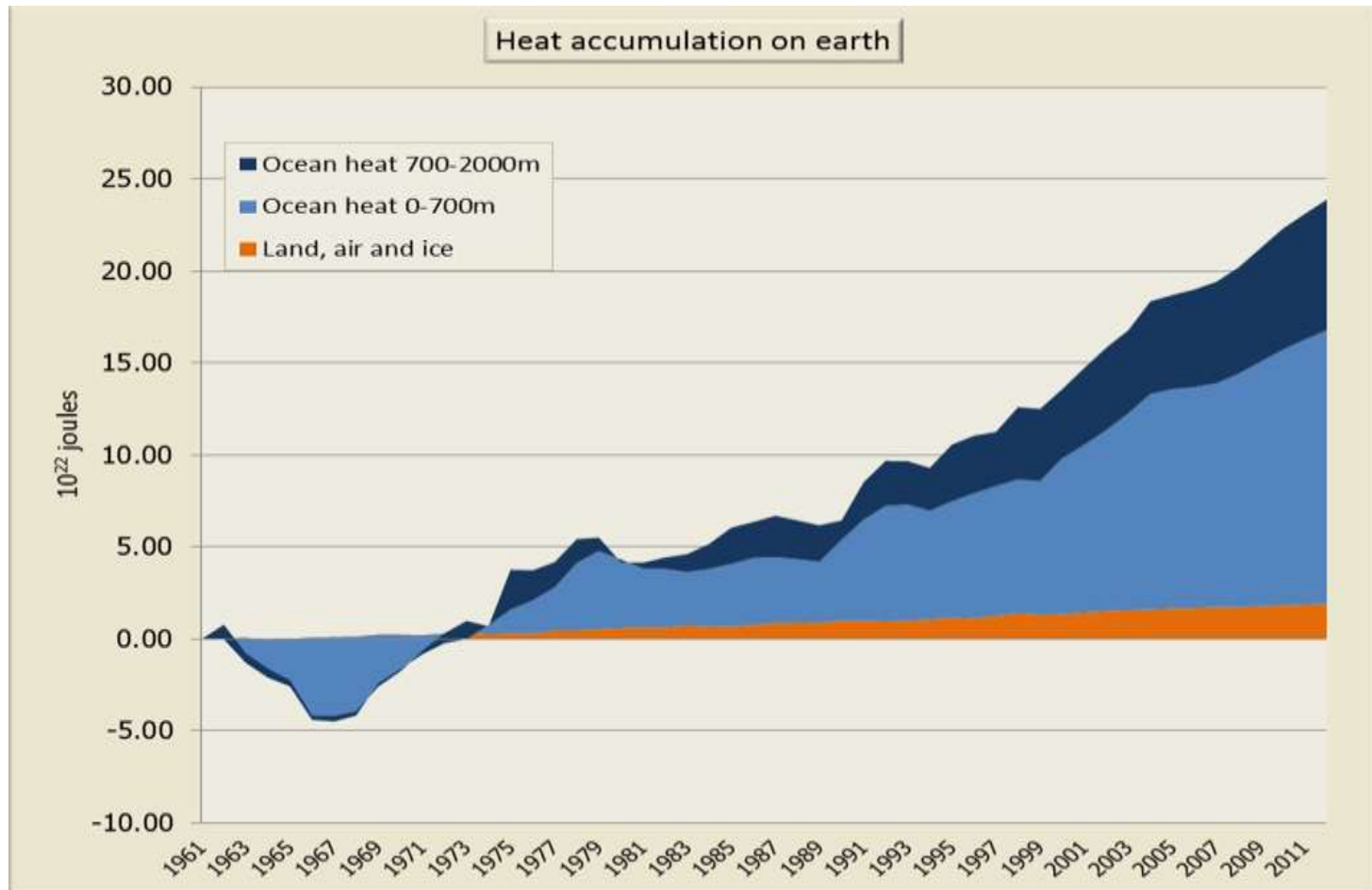


Source: R. Nicholls, Middlesex University in the U.K. Meteorological Office, 1997. *Climate Change and Its Impacts: A Global Perspective*.



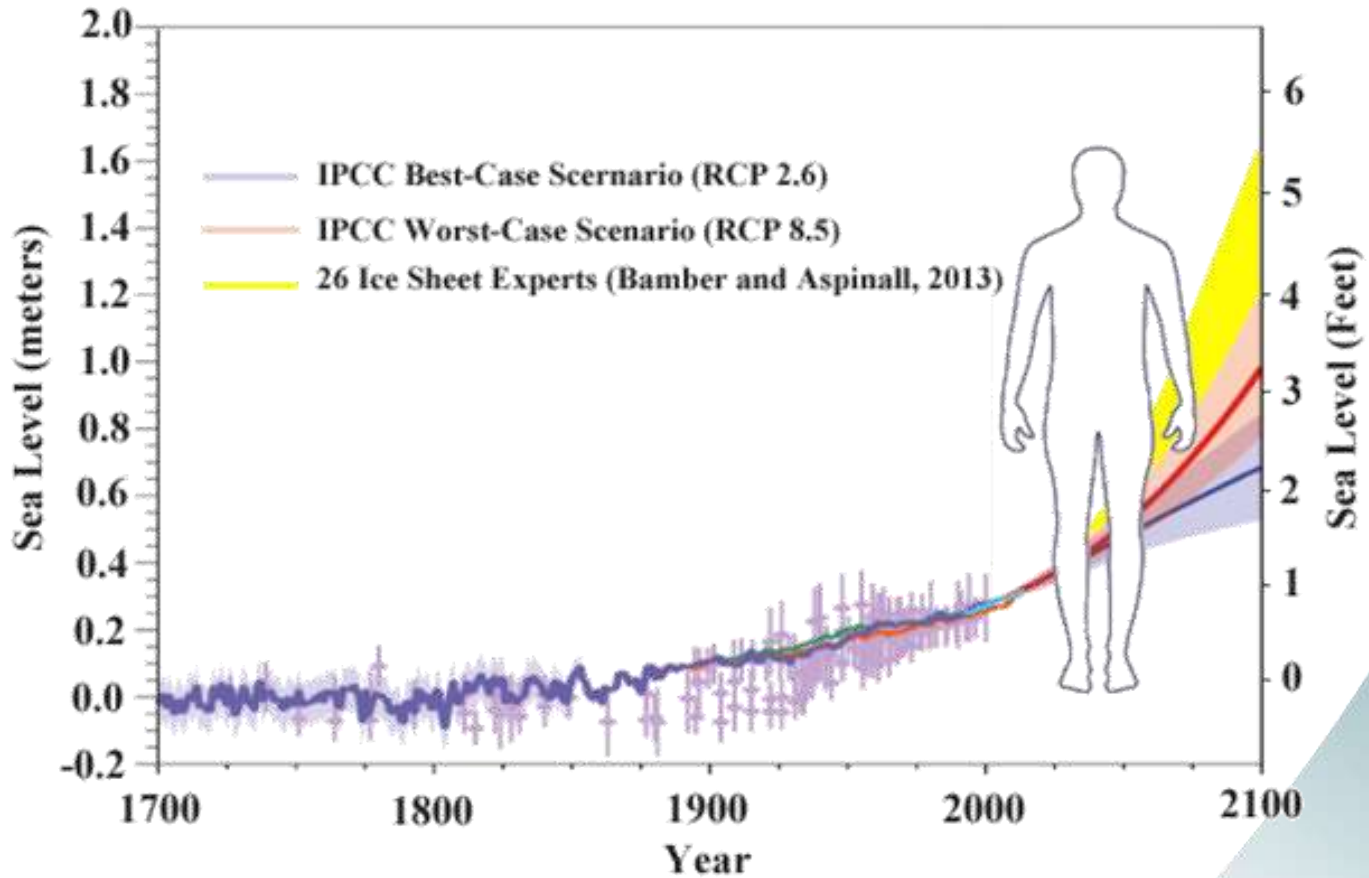
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# Our thermal profile is changing



# The future defined?

## Sea Level Rise: Observed and Predicted as of 2013



## *It's not just the sea rise*





Simple supply and demand.

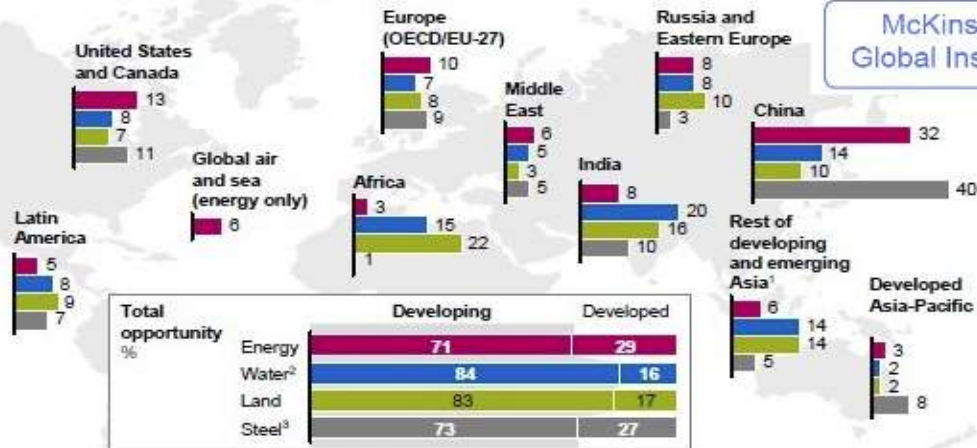


## Developing countries account for 70 to 85 percent of productivity opportunities

% of total productivity opportunity by resource and region

Energy Land  
Water Steel

McKinsey  
Global Institute



1 Rest of developing Asia includes Central Asia (e.g., Uzbekistan), South Asia (e.g., Bangladesh), Southeast Asia (e.g., Laos), and North Korea.

2 Includes water savings from water-specific levers as well as water savings from improved agricultural productivity.

3 For steel, the chart represents all the demand-side levers and the scrap recycling lever but excludes supply- and conversion-side levers.

NOTE: Numbers may not sum due to rounding.

SOURCE: McKinsey analysis

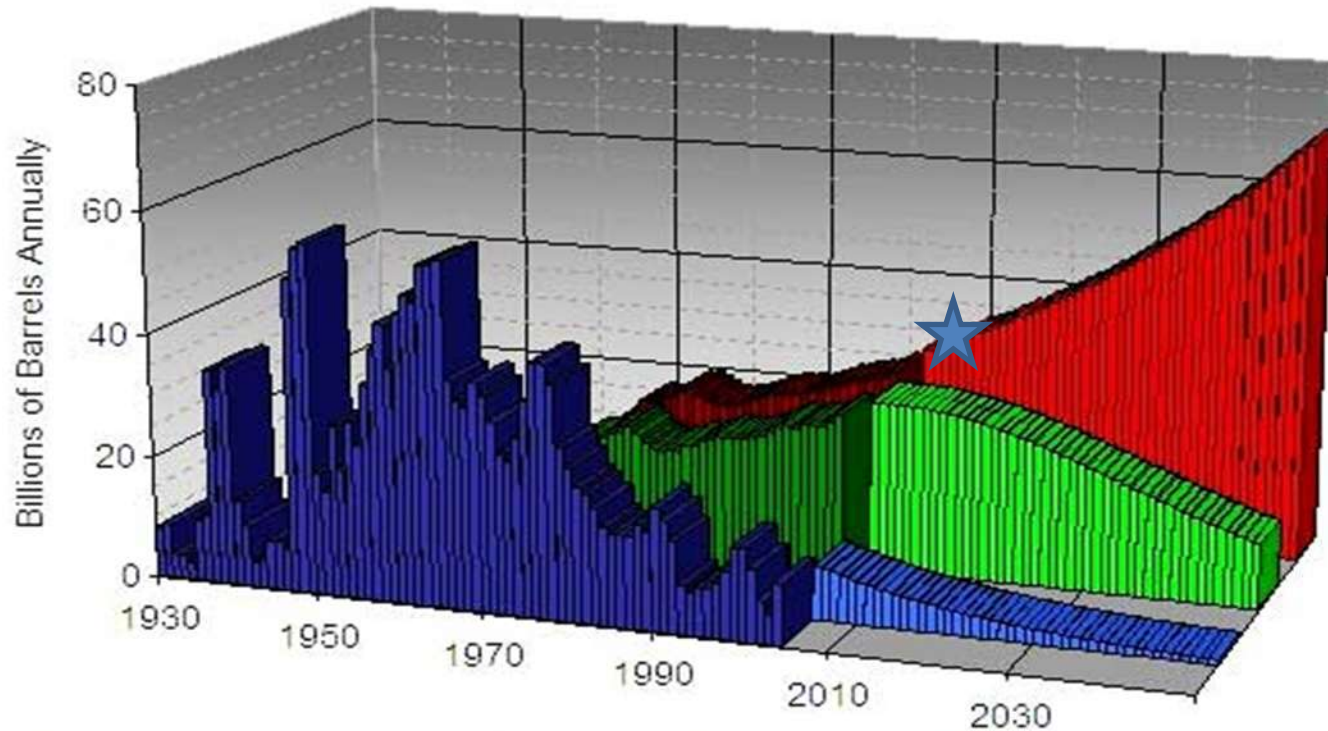
# The 20<sup>th</sup> Century: Bloodiest in History

*Can we avoid a similar fate for the 21<sup>st</sup> century?*



# Where the rubber meets the road

World Overview (Discovery, Production and Demand)



■ Annual Discovery      ■ Projected Discovery      ■ Annual Production  
■ Projected Production      ■ Annual Demand      ■ Projected Demand

Data Sources: EIA, BP, ExxonMobil


# US natural gas won't replace Russian supply as Europe seeks options

Posted on May 20, 2014 at 5:32 pm by **Bloomberg** in **LNG, Markets**

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U.S. exports of liquefied natural gas won't be able to replace Russian exports to Europe as the Ukrainian crisis threatens to disrupt flows to the region.

U.S. LNG supplies expected to start in the first quarter of 2016 won't be enough to compensate for Russian supplies that meet about 30 percent of Europe's gas needs, said Jean Abiteboul, president of Cheniere Supply & Marketing Inc. U.S. LNG exports won't have any bearing in the current conflict and deliveries will likely target higher-price markets in Asia, said Will Pearson, director for global energy and natural resources at consultant Eurasia Group.

"You cannot replace Russian gas with any kind of LNG, especially by U.S. LNG only," Abiteboul said yesterday in an interview at the Flame conference in Amsterdam. "It will probably force people to think more accurately on the diversification of supply, security of supply and not only price and could give an additional chance for LNG imports into Europe, including U.S."



A deal signed in May 2013 between Exxon Mobil Corp. and Qatar Petroleum International would add a liquefied natural gas export terminal to the existing Golden Pass import terminal in the Port Arthur community of Sabine Pass.

# Europe Has Several Possible Replacements For Russian Gas But All Are Risky, Expensive And Will Take Years To Develop

By [Meagan Clark](#) [@MeaganKay](#) [m.clark@ibtimes.com](mailto:m.clark@ibtimes.com) on March 27 2014 3:09 PM

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Gazprom is the biggest company in Russia and largest natural gas extractor in the world. In 2008, it produced 17 percent of global gas production and accounted for an astonishing 10 percent of Russian GDP. Reuters

WND EXCLUSIVE

## SAUDI ARABIA IN OIL-PRICE WAR WITH IRAN, RUSSIA

Riyadh avenging Moscow's backing of nemeses Assad, Iran

Published: 2 days ago



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King Abdullah

WASHINGTON – Saudi Arabia is extending its own international jihad not only through its export of Wahhabism, an extreme form of Sunni Islam.

