



Climate Migration

Guest Lecture • Canterbury Boys
Secondary School • 4 December 2012

**Field research into
climate migration solutions**

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Huene, Tulun Atoll

Ursula Rakova, Carteret Islander and Director of Tulele Peisa NGO, Papua New Guinea

Photo: Pip Starr

Ursula Rakova: “After Huene was sliced in two, my family settled on Huene One (right). There are three houses there. On Huene Two (left) there are only gardens. The channel keeps widening.”



<http://youtu.be/KBq2jNrD-yg> OR

<http://tv.unsw.edu.au/video/bolivia-leaving-the-land>

PLANET **PREPARE**

2008 World Vision
Preparedness Study

Protect Development
Research Priorities
Empower Communities
Partner And Network
Advocate Justice And Change
Reinforce Disaster Defences
Educate Children



http://wvasiapacific.org/downloads/publications/PlanetPrepare_LowRes.pdf

Island of Matsungan, Papua New Guinea

Chief Kela: “What will
the future hold for our
children and
grandchildren?”

Matsungan, Papua New Guinea: Island Chief John Kela (right) standing on what he says was formerly dry ground.

Photo: Johannes Luetz



**Island of Torotsian,
Papua New Guinea**

Photo: Johannes Luetz



**Island of Torotsian,
Papua New Guinea**



**Island of Torotsian,
Papua New Guinea**

Labutali, Papua New Guinea



Photo: Johannes Luetz

Group of environmental or climate change related forced migrants who abandoned their coastal village “because of rising sea levels.”

Photo: Johannes Luetz



**Puwamo, Papua
New Guinea**

Albert Nai: “The bush is better than the beach!”
(At his new home with two of his grandchildren)

Mohammad Shamsuddoha:
“Bhola – Bangladesh’s biggest island – is eroding. From a size of 6,400km² in the 1960s, Bhola is now only half its original size.”

*(General Secretary
Equity & Justice
Working Group)*



**Bhola Island,
Bangladesh**

Tajumuddin, Bhola, Bangladesh: (Photo: Johannes Luetz)



Present: 100,000 displaced p.a.

SLR 1m: 65 million

SLR 3m: 92 million

SLR 5m: 128 million

(Displacement potential in South Asia under different sea level rise scenarios, Rajan 2008)

Tajumuddin, Bhola, Bangladesh: (Photo: Johannes Luetz)

Bhola Island, Bangladesh

Abdul Mannan: “The place where I was born lies 5 kilometres out in the sea. I’ve already moved my home and family four times.” Community elder Abdul Mannan (centre) points out signs of erosion.



Abdul Mannan:

“People are constantly moving back. This family left last week. Only the toilet pit is left.”

**Bhola Island,
Bangladesh**

Tajumuddin, Bhola, Bangladesh: (Photo: Johannes Luetz)

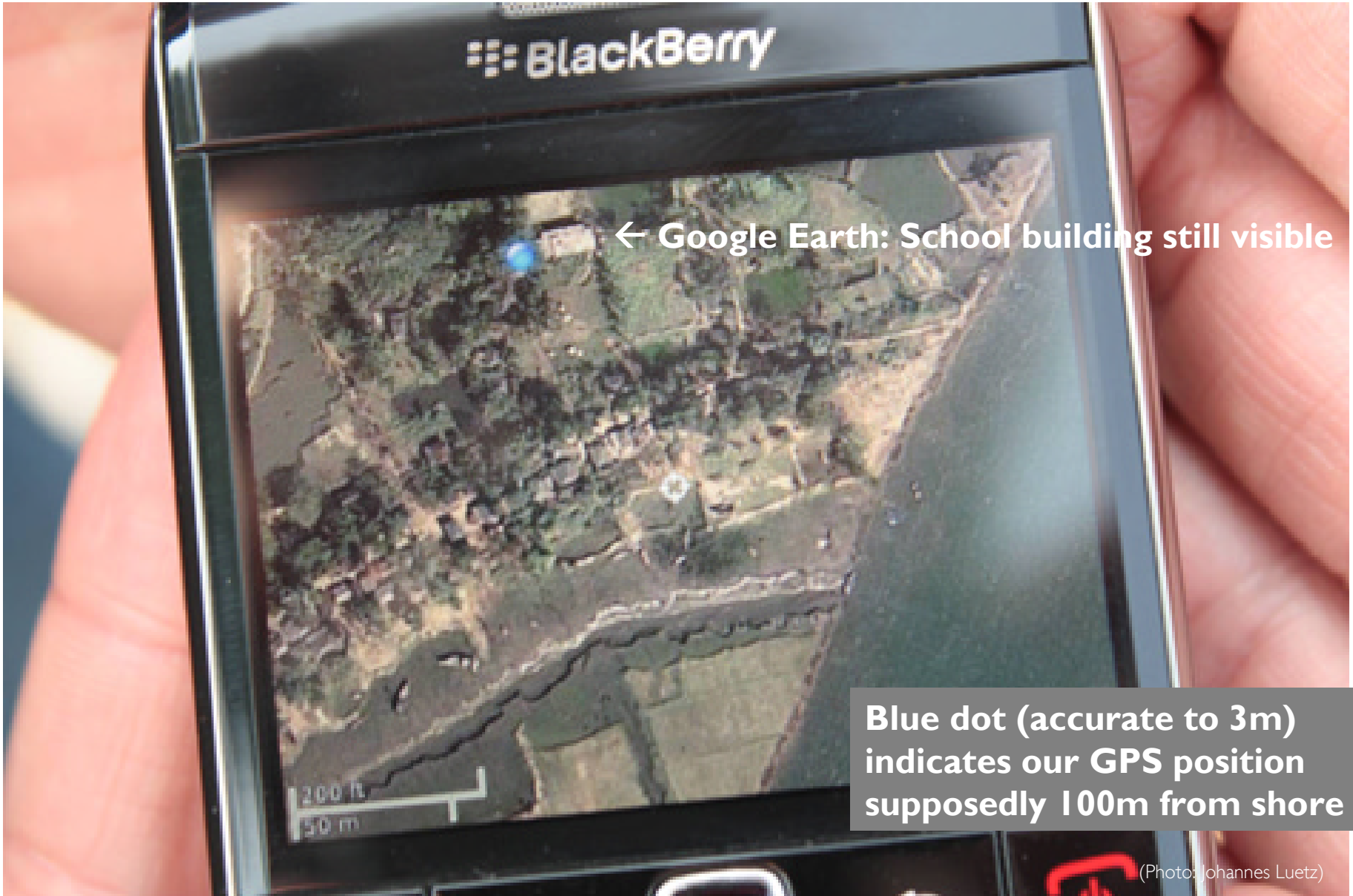
Bridge to “nowhere” (2011)



Show field research video footage:

File name “Bangladesh I”:
55:00 (1min) – Bridge to “nowhere”


(Photo: Johannes Luetz)



← Google Earth: School building still visible

Blue dot (accurate to 3m) indicates our GPS position supposedly 100m from shore

(Photo: Johannes Luetz)



Student from that very same school pointing to where class rooms used to be 6 months ago

Show field research video footage:

File name “Bangladesh 2”:

31:20 (seconds) – Google maps!

34:00 (3min) – student

This is the same location at the GPS derived Google Earth “blue dot” (accurate to 3m)

(Photo: Johannes Luetz)



Show field research video footage:

File name “Bangladesh 5”:

46:00 (1min) – Dhaka tenants, settlements

59:00 (30sec) – Bhola-CEGIS (6km@61min)

00:00 (3min) – INDIAI: erosion/ accretion

**Md. Faruk, migrant from
Bhola Island interviewed at
Dhaka slum**

(Photo: Johannes Luetz)

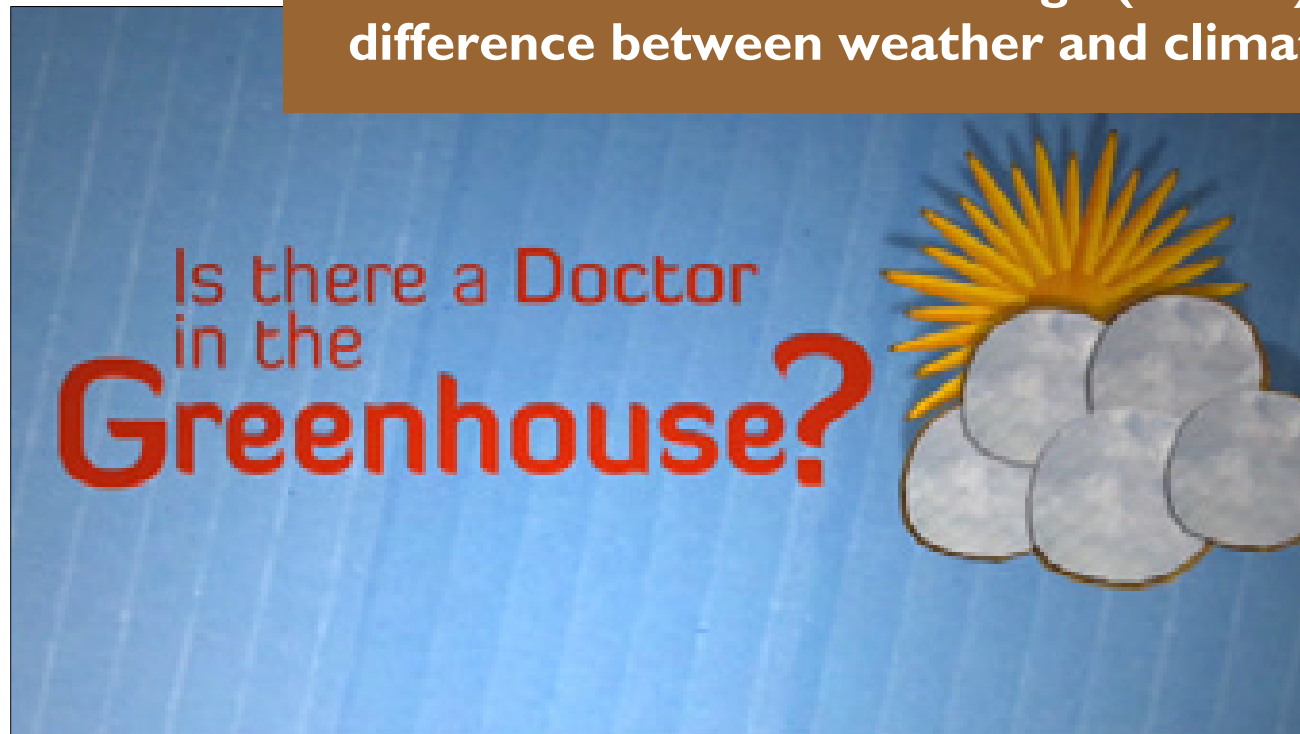


Adapted from Milliman *et al.* (1989).
Presentation by Sir John Houghton 7 Sep 2011

Climate change and small island states

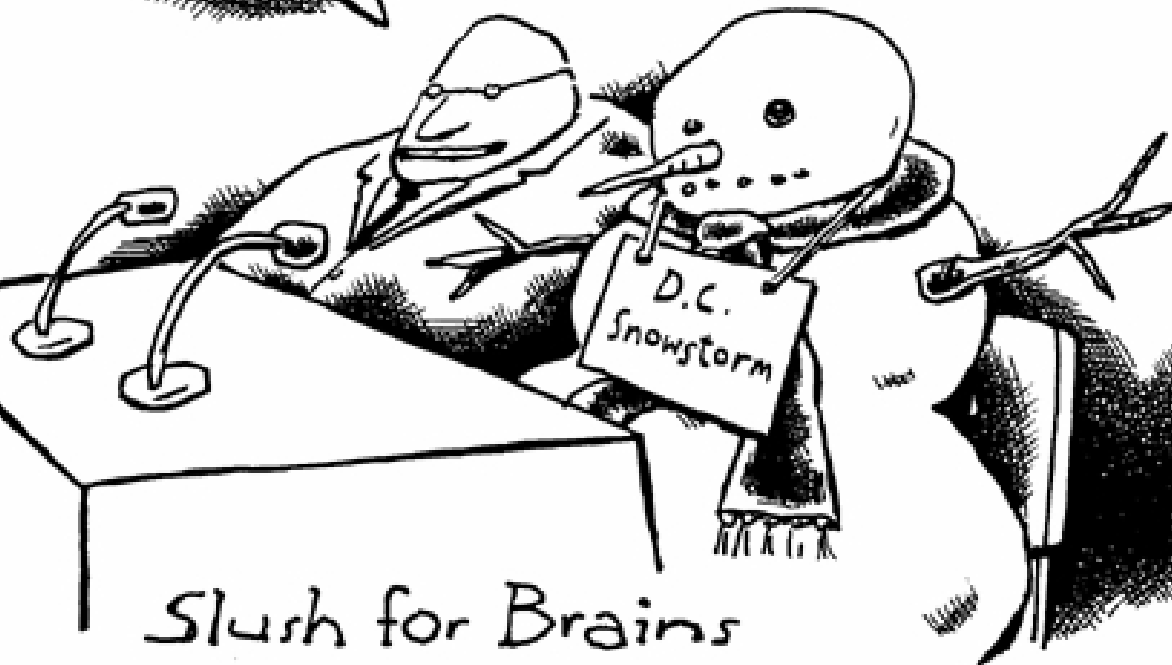
- 1. Climate Change Science**
2. Impacts
3. Research Problem and Methodology
4. Discussion
5. Conclusion and Policy Recommendations

UNSW-produced video scripted for Leadership Networks for Climate Change (LNCC) to highlight difference between weather and climate



<http://tv.unsw.edu.au/04E68CE0-08D5-11E1-832C0050568336DC>

I HAVE A NEW
EXPERT WITNESS
TO DISPROVE ALL THE
CLIMATE CHANGE SCIENCE!



Slush for Brains

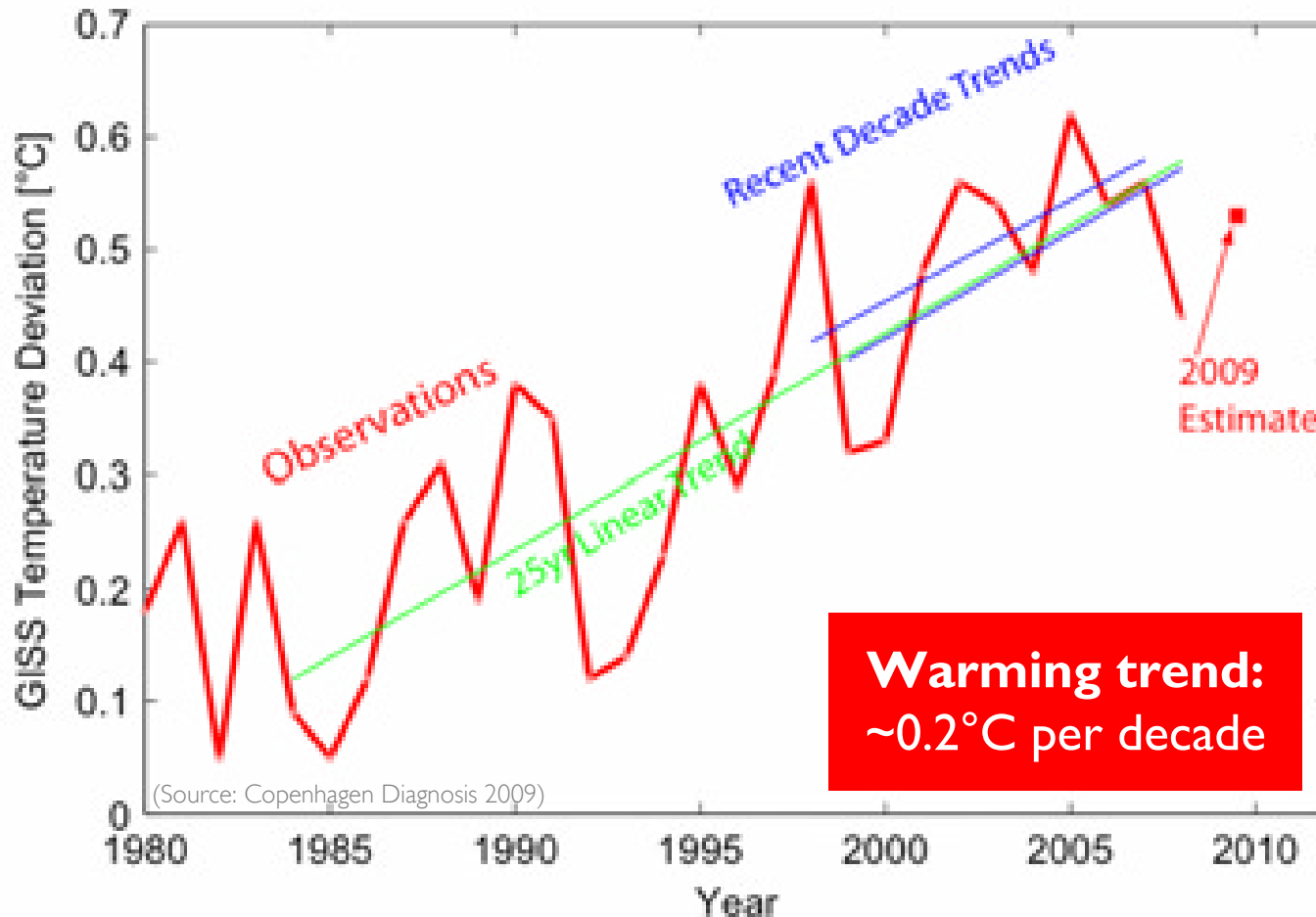
TUESDAY 20 DECEMBER 2012 THE WASHINGTON POST

WHERE'D
HE GO?



(Source: ppt Stephen H. Schneider)

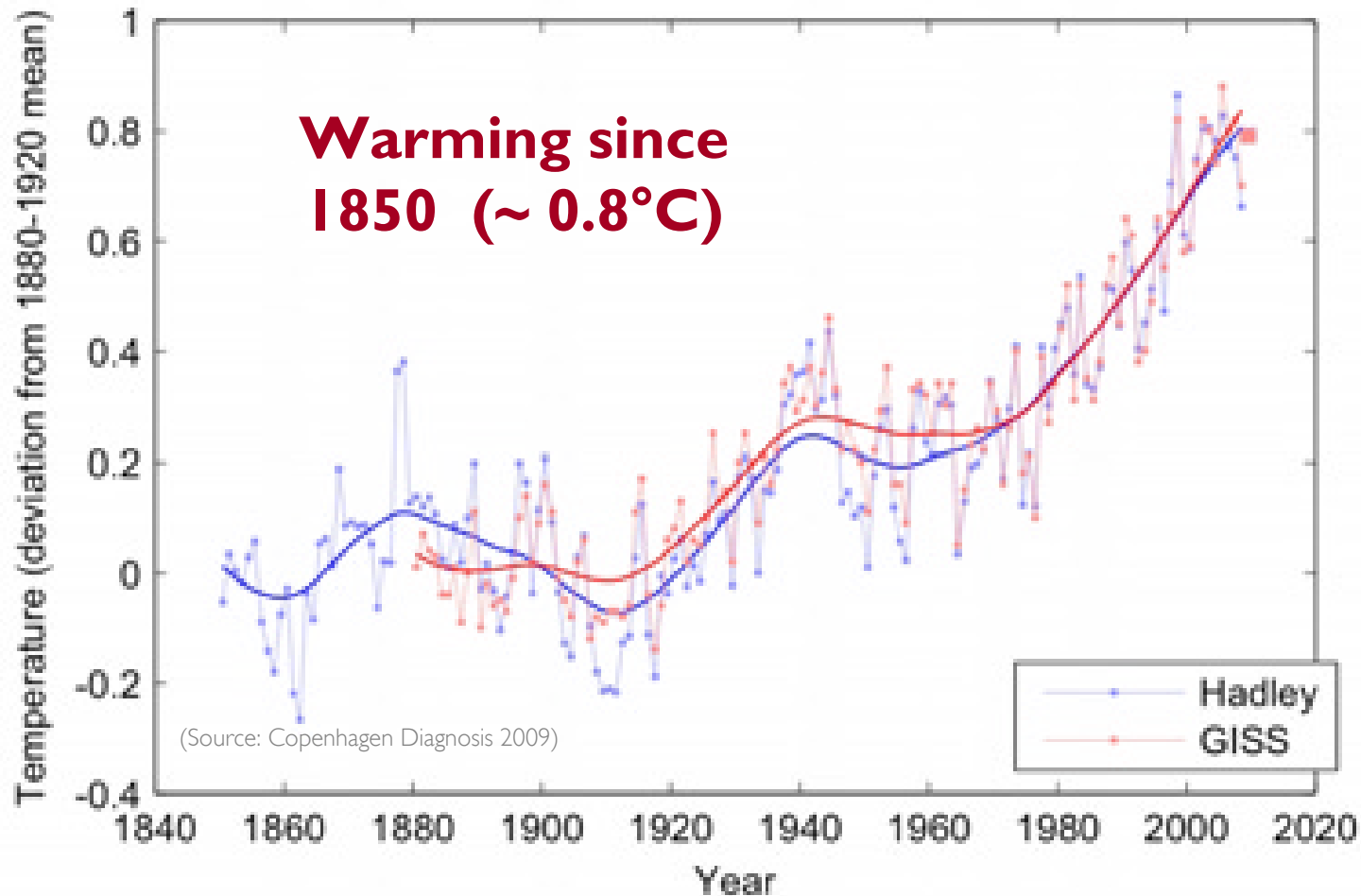
Global temperature change 1980-2009



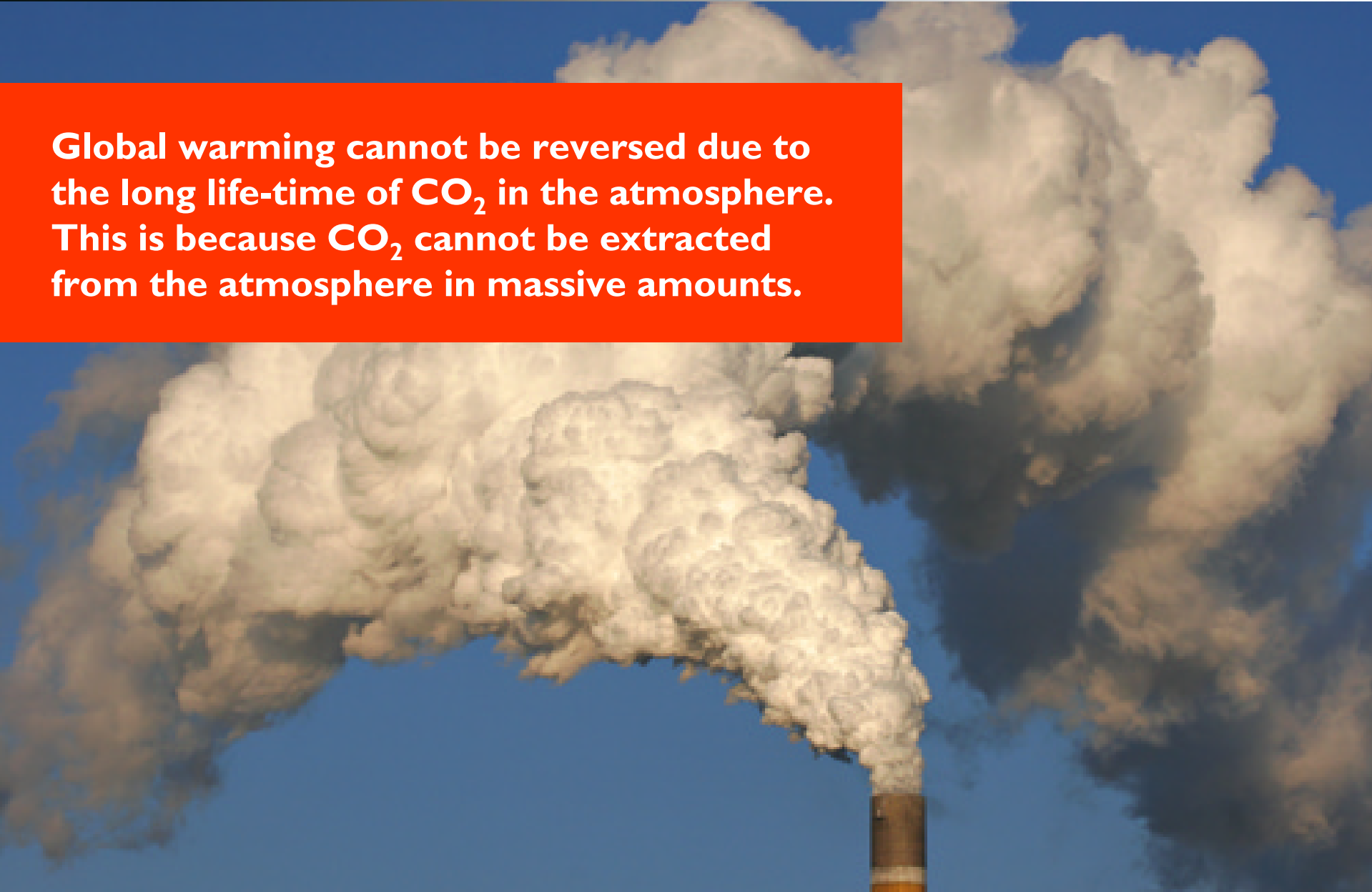
(Source: Copenhagen Diagnosis 2009)

(Source: NASA GISS data, In: Copenhagen Diagnosis 2009)

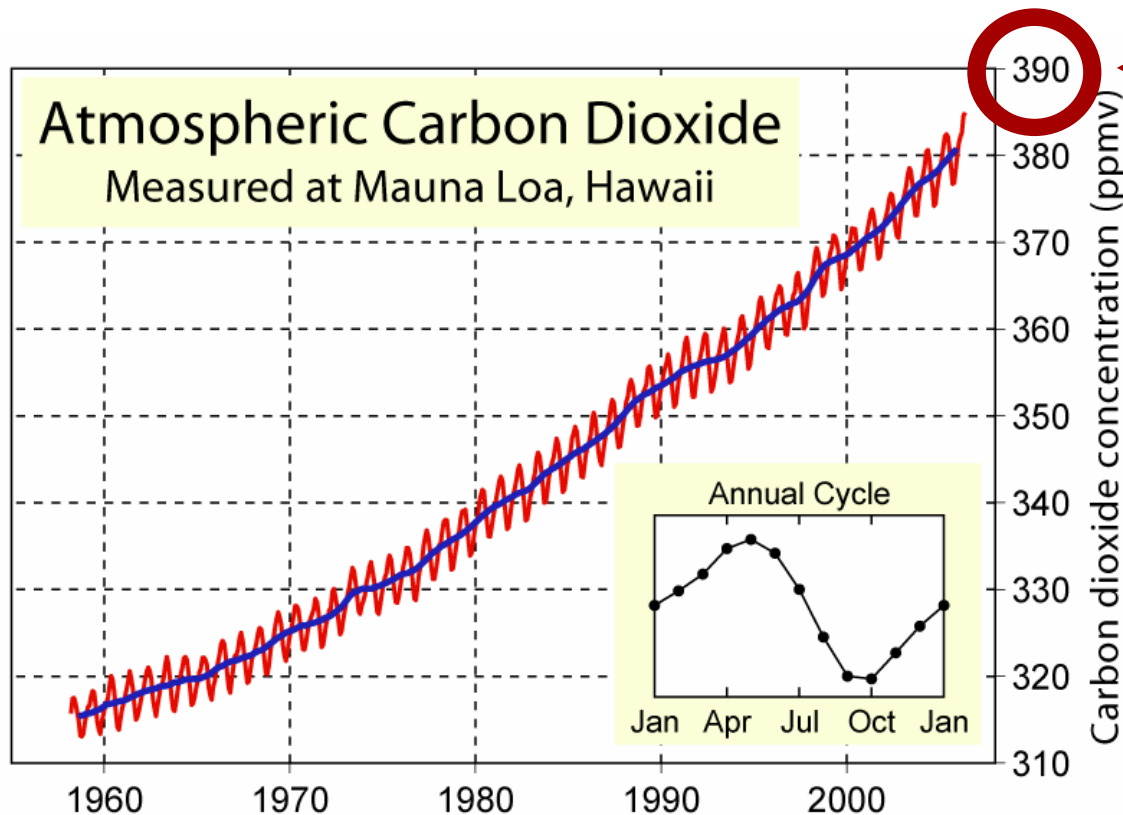
Global average temperature 1850-2009



Global warming cannot be reversed due to the long life-time of CO_2 in the atmosphere. This is because CO_2 cannot be extracted from the atmosphere in massive amounts.

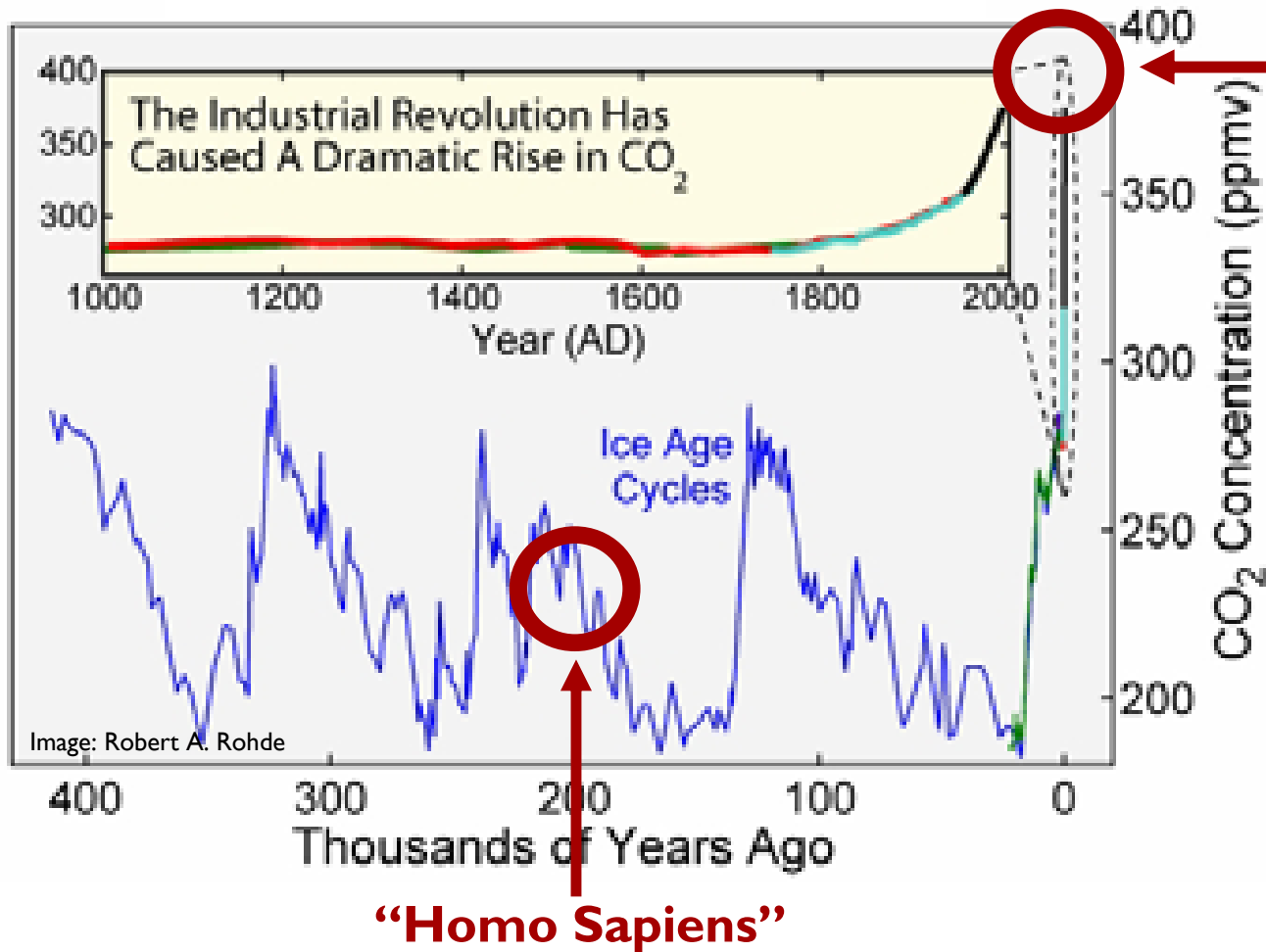


CO₂ level in March
2010: 390 ppm



The Keeling curve is an essential piece of evidence of anthropogenic greenhouse gas increases. The longest such record exists at Mauna Loa, Hawaii.

(Source: National Oceanic and Atmospheric Administration -- ftp://ftp.cmdl.noaa.gov/ccg/co2/trends/co2_mm_mlo.txt).



CO₂ level in March 2010: 390 ppm

Today's CO₂ levels are unprecedented in the last 800,000 years; potentially the last 3-20 million years.

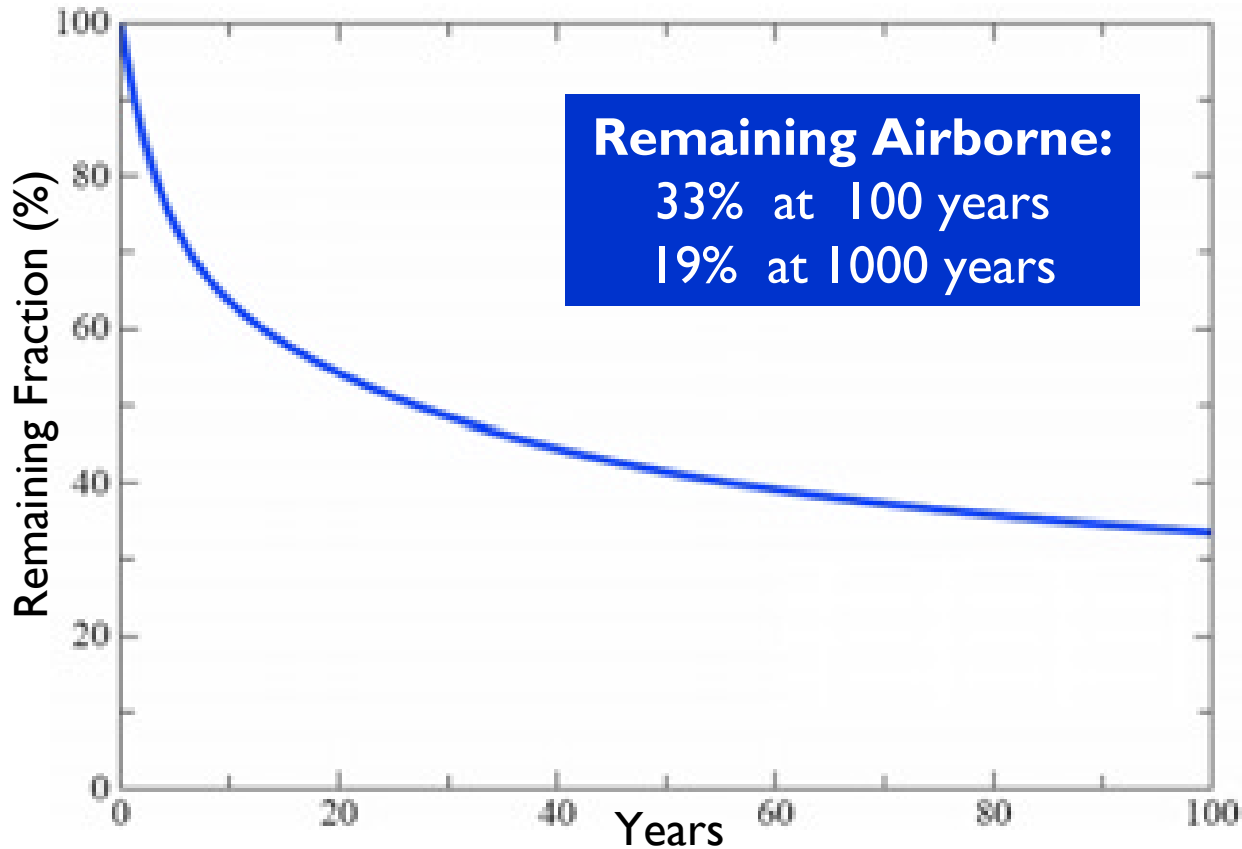
(Sources: 1. (blue) Vostok ice core. 2. (green) EPICA ice core. 3. (red) Law Dome ice core. 4. (cyan) Siple Dome ice core. 5. (black) Mauna Loa)

UNSW-produced video scripted for Leadership Networks for Climate Change (LNCC) to explain that climate change cannot be stopped overnight; action is therefore urgent.



<http://tv.unsw.edu.au/video/hit-the-brakes>

Slow decay of fossil fuel CO₂ emissions



The fraction of CO₂ remaining in the air, after emission by fossil fuel burning, declines rapidly at first, but 1/3 remains in the air after a century and 1/5 after a millennium.

(Hansen, J, 2007, *Atmos. Chem. Phys.* **7**, 2287-2312).

Boeing 767-300



**1t Jet Fuel Burned
= 3.157t CO₂ Emissions**

(Photo: Adrian Pingstone)

Top of Atmosphere as seen from space at 335km altitude
(Photo: NASA Earth Observatory)

Per-capita emissions for
Canada trip in 2010: 1.4t CO₂
(2110: 460kg, 3010: 260kg)

* 2.7 (Radiative Forcing
Index, RFI) = ~ 3.8t CO₂



“Granny Maria” – 1958



Lloyd Alexander, 1958



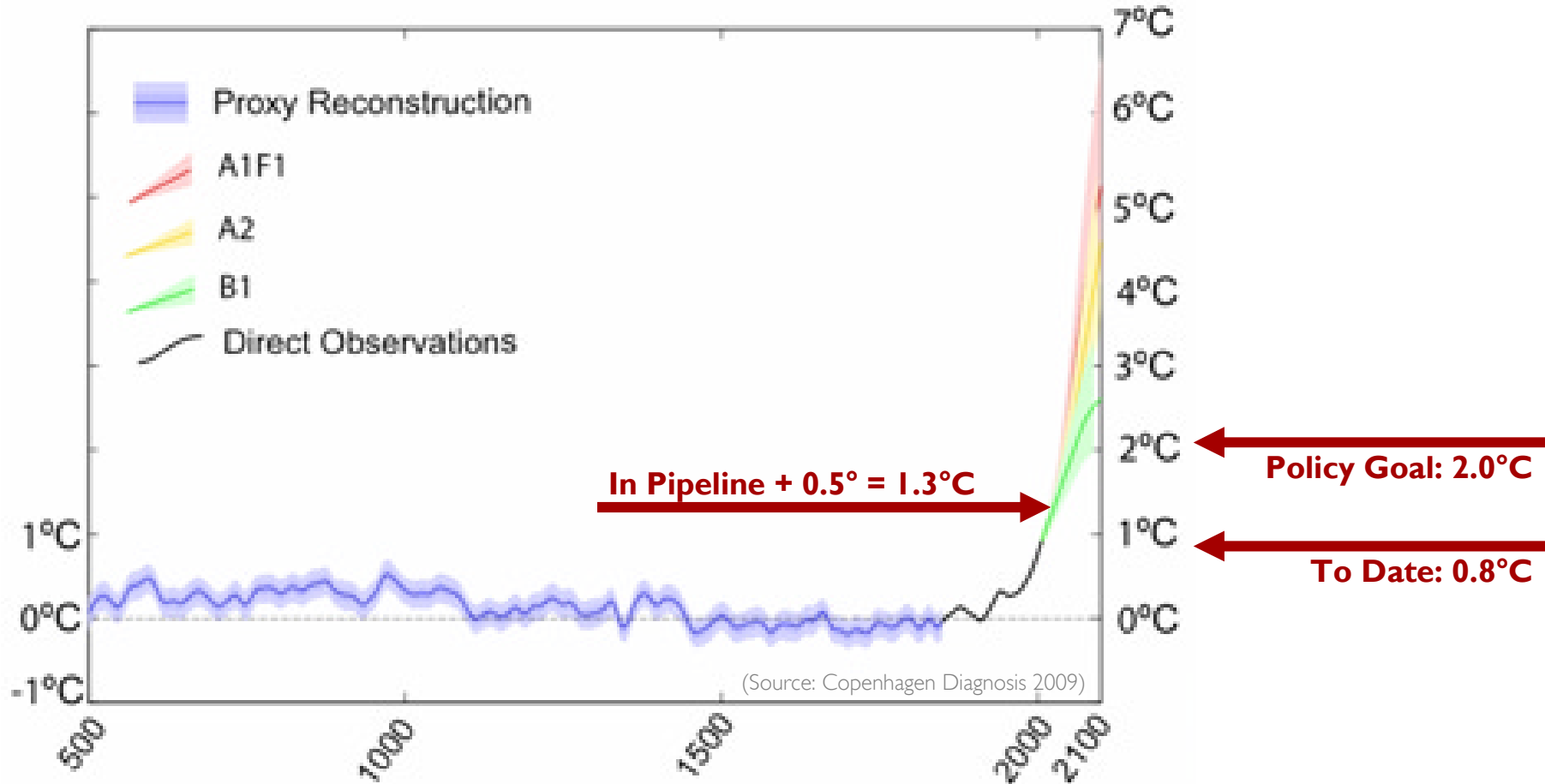
40% of total emissions from granny's 1st car still airborne today (~ 5,200 kg CO₂) as "historical emissions"

Cumulative CO₂ Emissions 1850-2006

Rank	Country	Mt CO ₂ e	% of World Total
1	United States of America	333,747.8	29.00%
2	European Union (27)	305,750.1	26.57%
3	China	99,204.2	8.62%
4	Russian Federation	93,081.6	8.09%
5	Germany	[80,377.0]	[6.99%]
6	United Kingdom	[68,235.8]	[5.93%]
7	Japan	44,535.2	3.87%
8	France	[32,278.6]	[2.81%]
9	India	27,433.6	2.38%
10	Canada	25,133.1	2.18%
Top 10	Cumulative Total	928,886	80.71%

CAIT, World Resources Institute
 CAIT GHG data are derived from CDIAC, EDGAR, EIA, EPA, Houghton, IEA, and WB.

Reconstructed, observed and future warming projections





Available resources:

- Audio files
- Presentation files

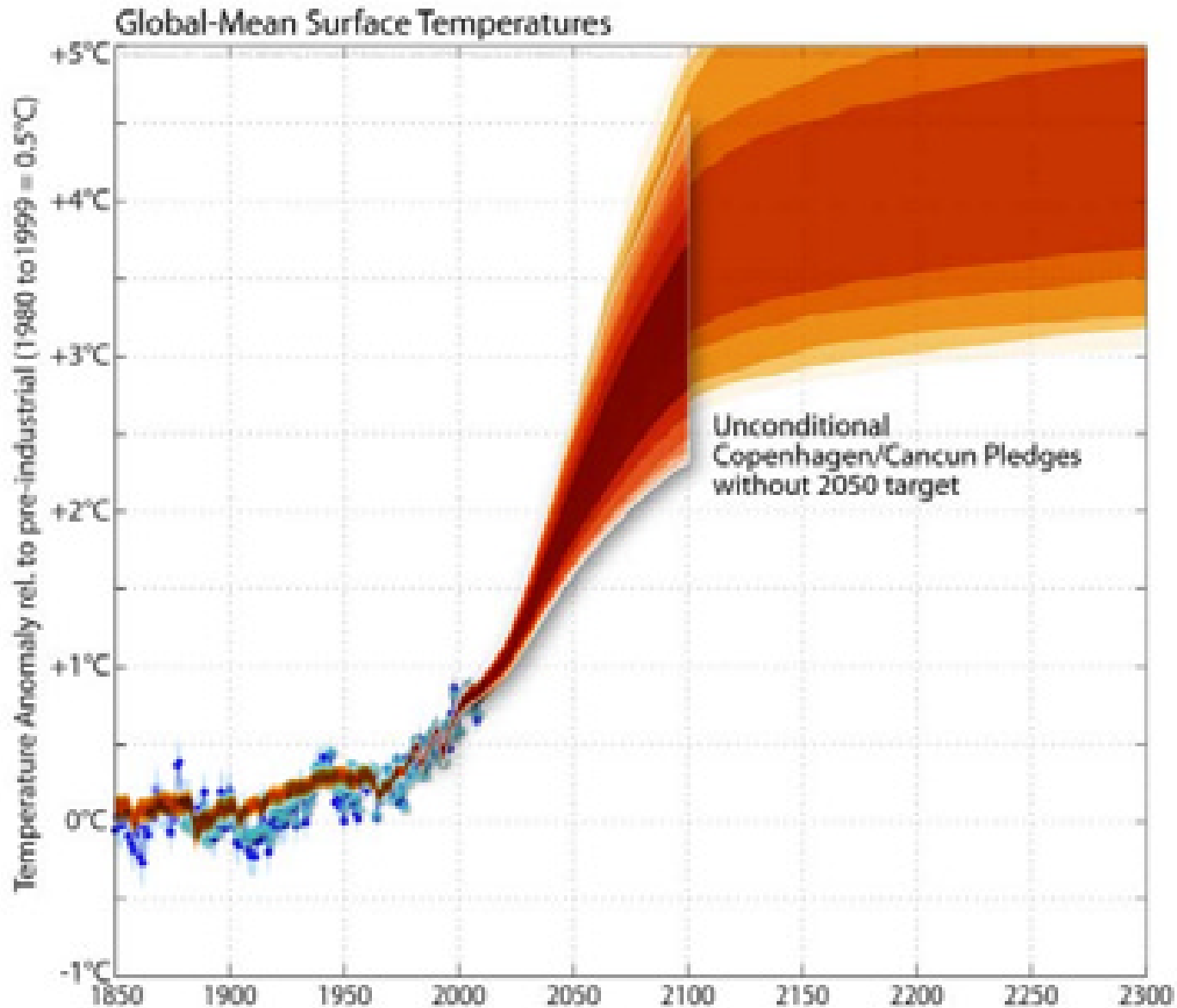
Conference

12-14 July 2011, Melbourne

FOUR DEGREES OR MORE? AUSTRALIA IN A HOT WORLD

www.fourdegrees2011.com.au

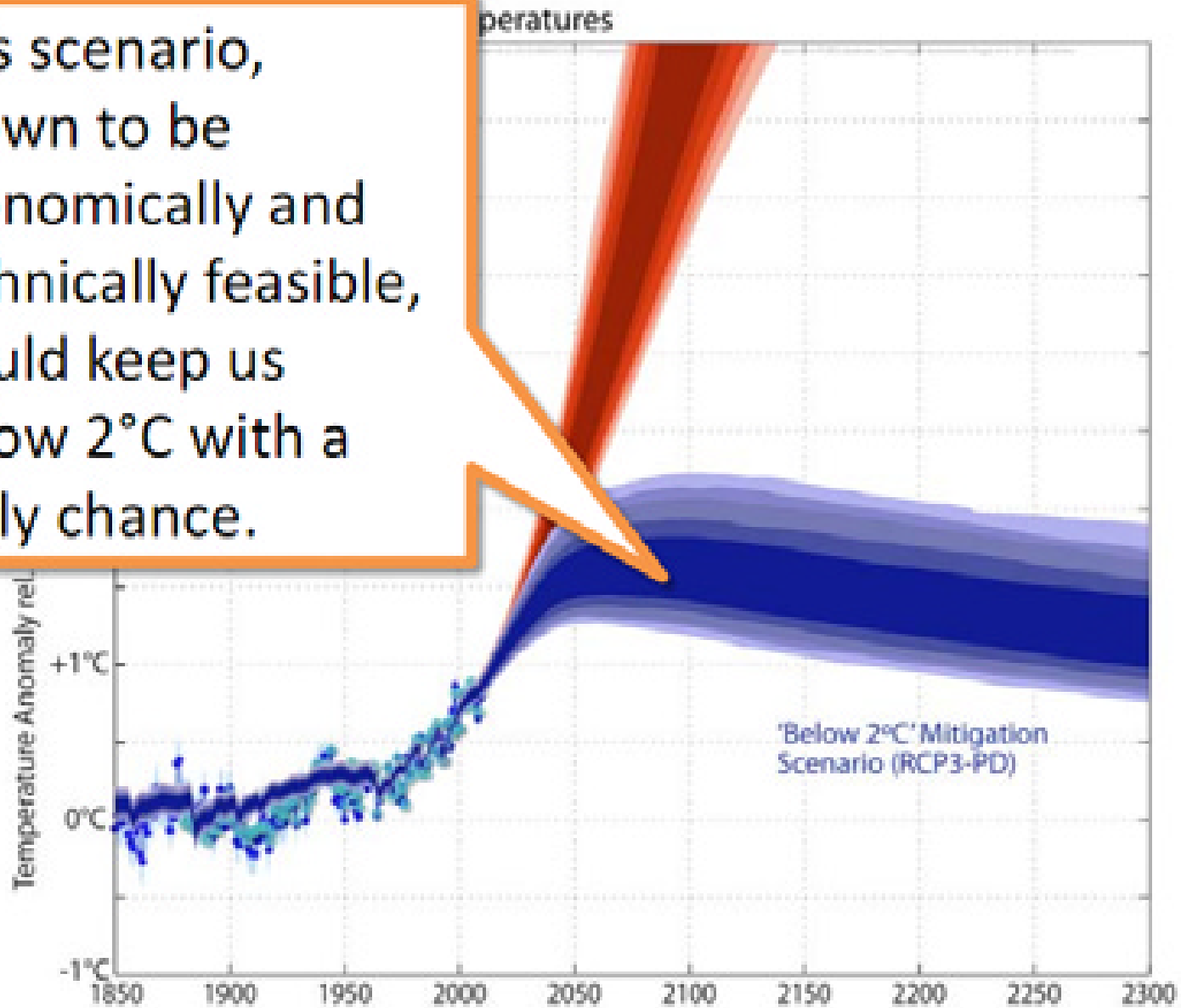
Copenhagen implemented



Based on: Rogelj et al., Nature, 2010

Source: Meinshausen 2011, presentation available:
<http://www.fourdegrees2011.com.au/presentations/>

This scenario, shown to be economically and technically feasible, would keep us below 2°C with a likely chance.



Source: Meinshausen 2011, presentation available: <http://www.fourdegrees2011.com.au/presentations/>
File Local Data: HADCRUT3 & GISS-ERMAP, 2007, orange-ha@met.rdg.ac.uk based projection modified as in Meinshausen et al. 2009, Nature

Climate change and small island states

1. Climate Change Science
- 2. Impacts**
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South Africa
Western Cape
21 July 2002

Photo: NASA



South Africa
Western Cape
21 July 2003

Photo: NASA

“Climate change will make it harder to manage the world’s water. People will feel many of the effects of climate change through water. The entire water cycle will be affected. While the world as a whole will get wetter as warming speeds up the hydrological cycle, increased evaporation will make drought conditions more prevalent. Most places will experience more intense and variable precipitation, often with longer dry periods in between. The effects on human activity and natural systems will be widespread.”

—*World Bank, World Development Report 2010*



Sinazongwe, Zambia

What looks like a desert or seashore is a field where crops were planted last season. Floods washed away both crops and soil, leaving only sand and a bleaker outlook on the future.



Photo: Jon Warren / World Vision

DRIEDUP

Kerkorisogal, Kenya: Children learn English under a tree, taught by teacher James Nakure Etot (36). Kerkorisogal is named for the river that runs through it. But the river hasn't flowed in a year and a half. Ekurichanait Naborkut (34), head teacher at Kerkorisogol School, says hunger often hits his classroom hard: "When there is no food, the children become sleepy and are absent."



Photo: World Vision Philippines

Cainta / Pasig, Philippines: Two days after Typhoon Ketsana/Onday's landfall, World Vision Philippines, with the help of a Coast Guard helicopter, drops 75 relief packs. Flood waters remain high, trapping thousands of people. (September 2009)

WATERED **DOWN**

**Precipitation rate
increase by 5-10%
per °C warming**

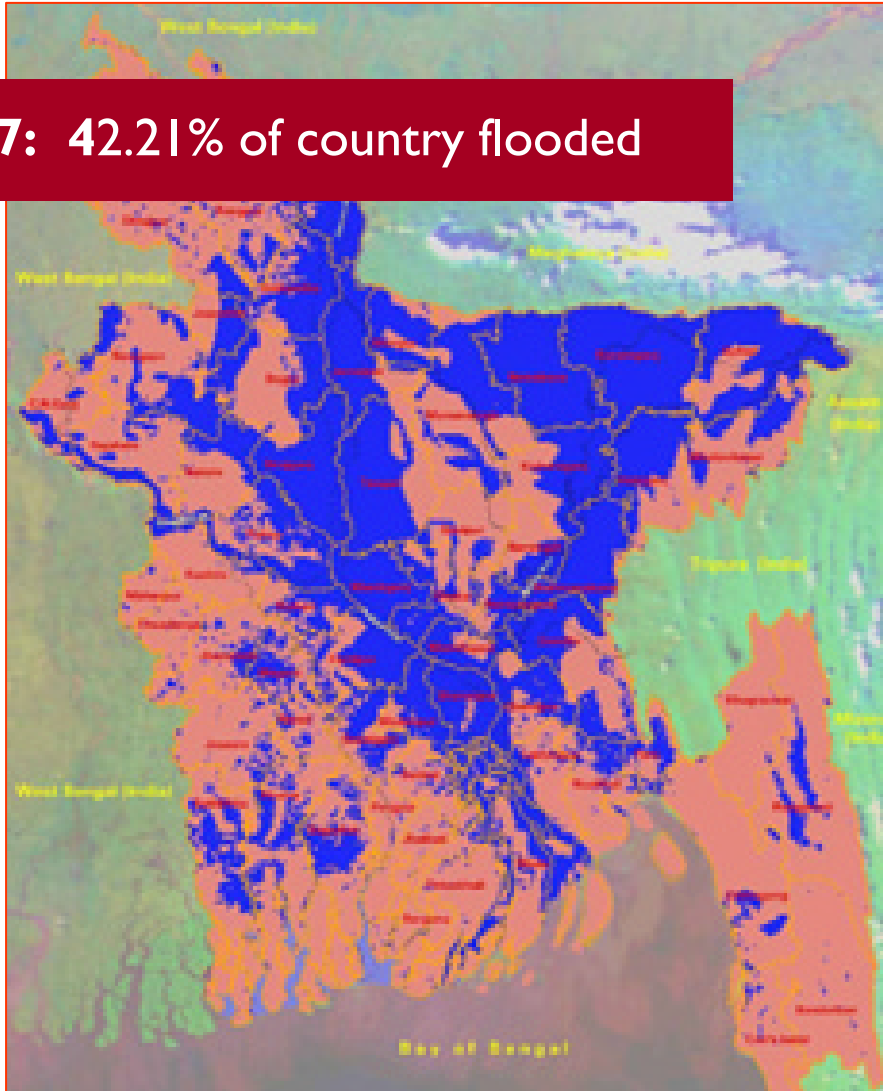
“
When it
rains, it
pours”



Khailshabunia (Bangladesh) under water

Photo: Amio Ascension / World Vision

2007: 42.21% of country flooded



**Bangladesh,
world's largest
river delta:**
One-third floods
annually during
the monsoon.
Extreme floods
cover up to two-
thirds of the
country.

Bangladesh Space Research and Remote Sensing Organization (SPARRSO). Satellite image: August 2,3,4,5,7 & 8, 2007

Tropical Storm Ketsana over the Philippines, 26 September 2009

Study: 1°C global warming = 30% increase in tropical cyclones?

Photo: National Oceanic and Atmospheric Administration (NOAA)

<http://www.chrispforr.net/phils/survivors/survivors.htm>



Show field research video footage:

File name “Philippines 5”:

20:30 (1min) – Typhoon belt shifted south

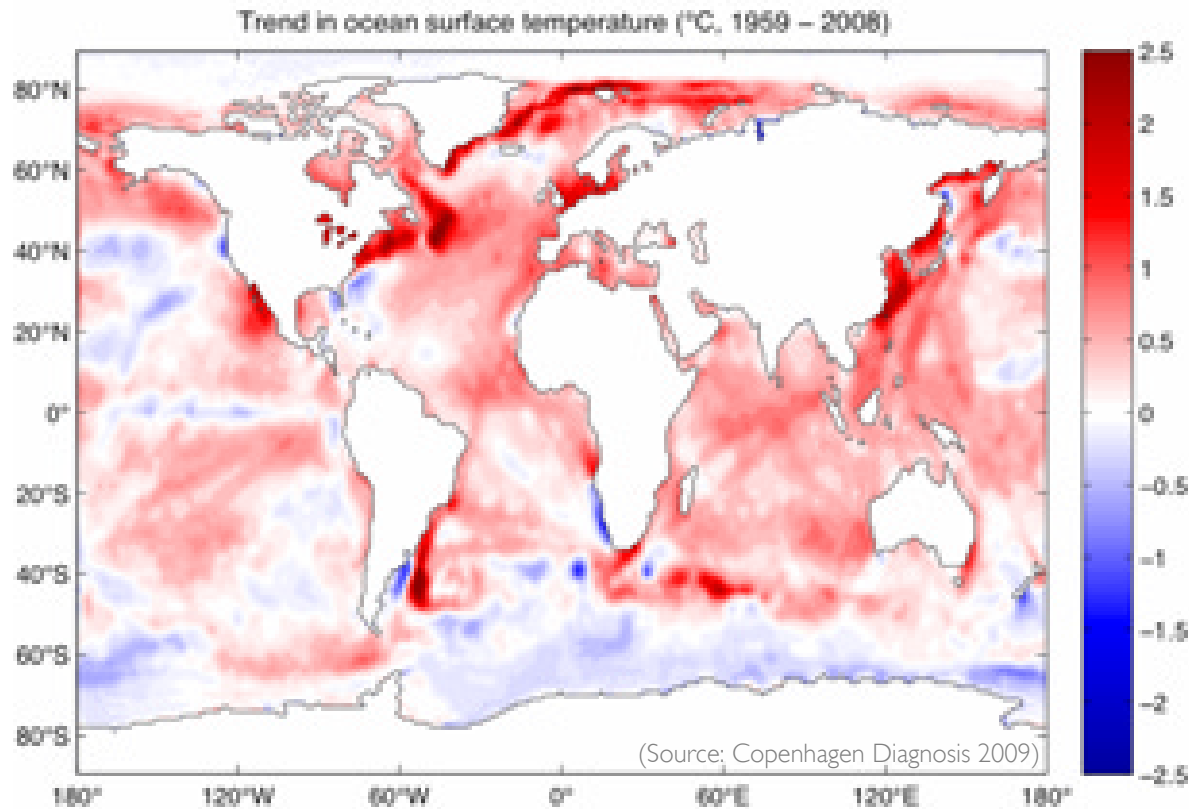
31:00 (1min) – Wealth accounting

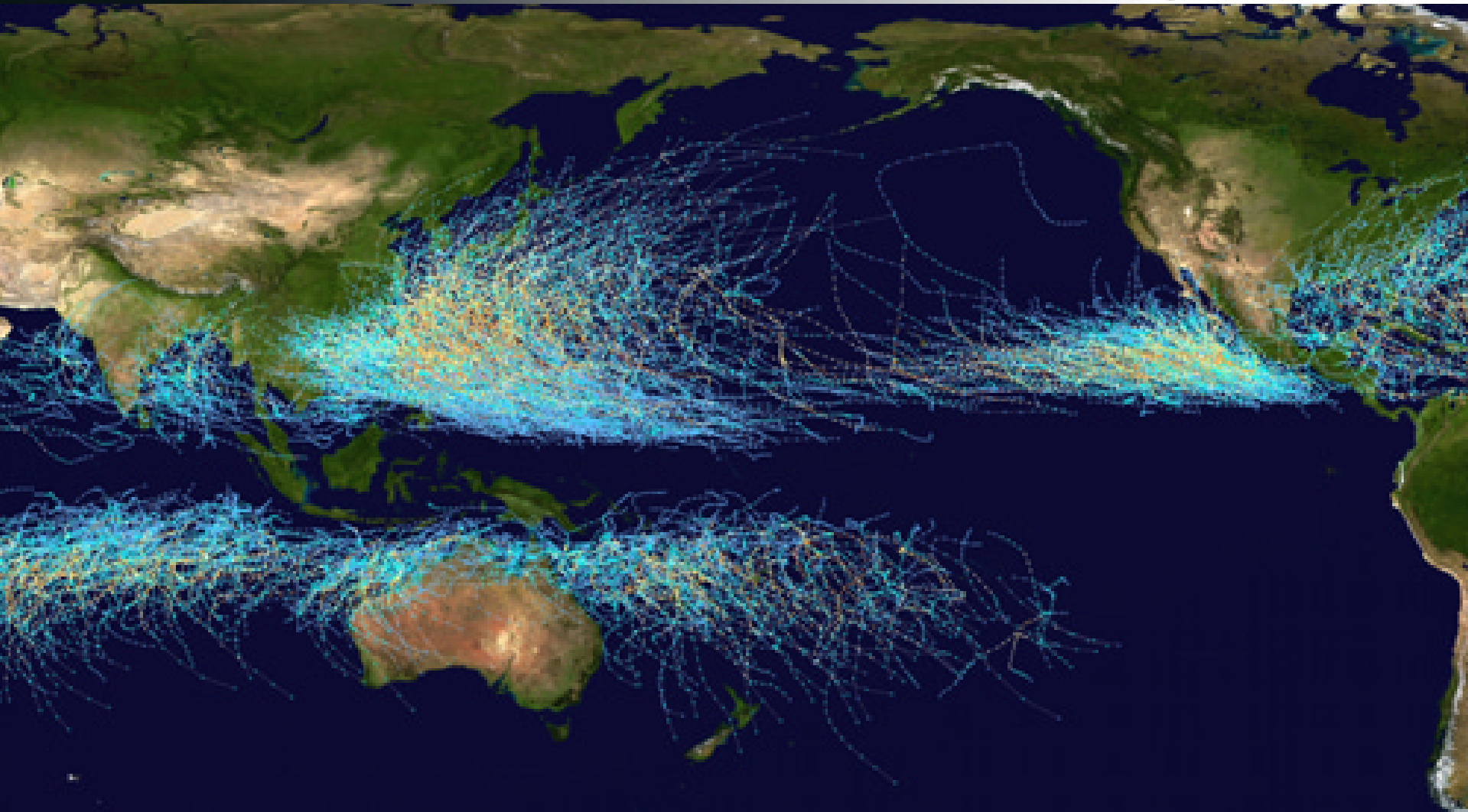
File name “Philippines 8”:

05:00 (1min) – Severe Tropical Storm Washi

(Photo: Chris Pforr)

Ocean heat uptake 50% higher than previous calculations





Hurricane Tracks 1985-2005

Photo: NASA / Nilfanion

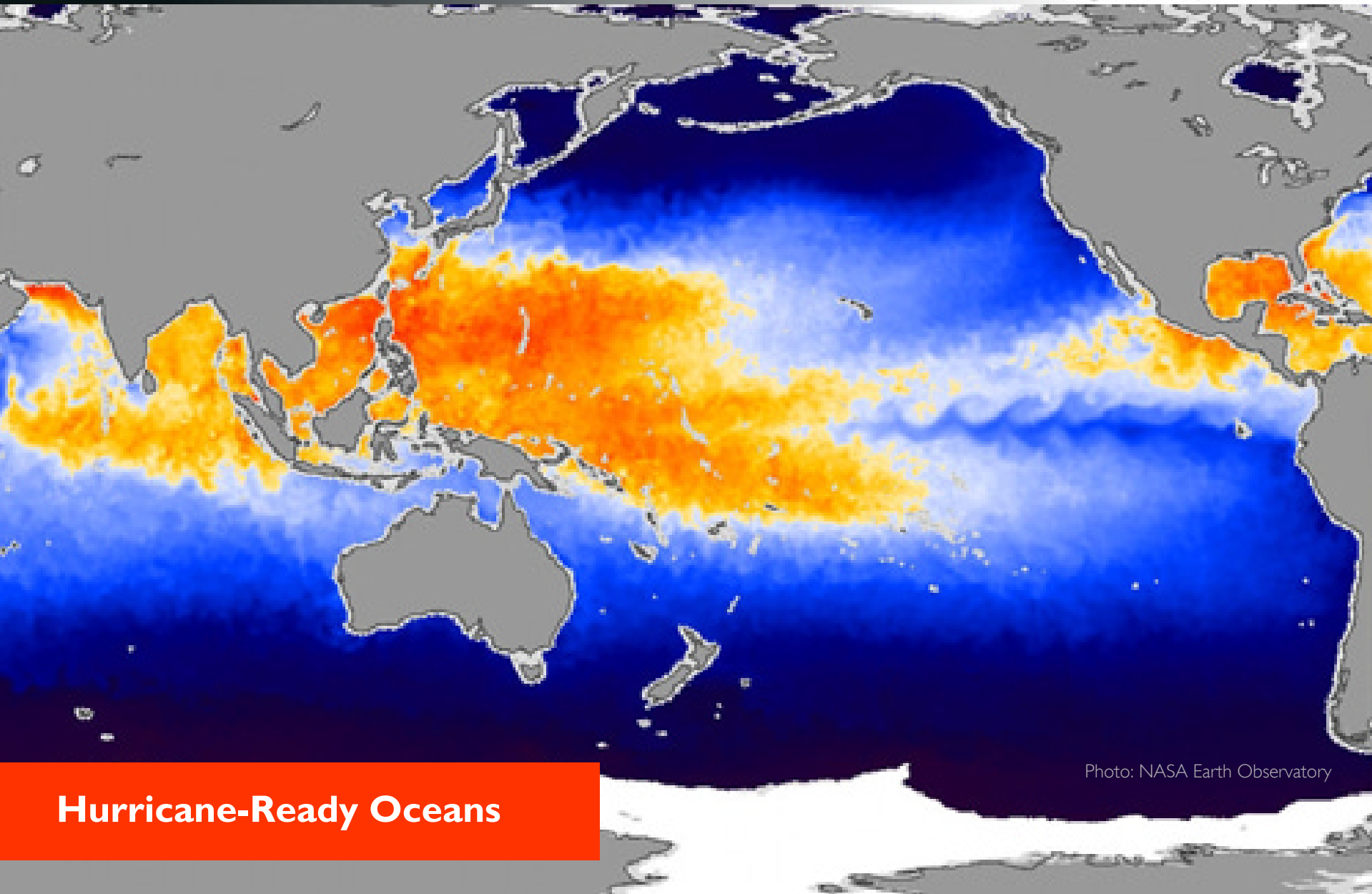


Photo: NASA Earth Observatory

Hurricane-Ready Oceans

Storm Surges

Before Cyclone Nargis

Photo: NASA/MODIS Rapid Response Team

15 April 2008

Storm Surges: Most lethal aspect of wind storms. Hydrological conditions can lift sea level by multiple metres and drive a massive flood of sea water many kilometres inland.

Storm Surges

After Cyclone Nargis

Photo: NASA/MODIS Rapid Response Team

5 May 2008

World Bank Natural Disaster Hotspots Report:
“By far the most certain aspect of climate change that will influence surge characteristics is global-mean-sea-level-rise ... The overall conclusion is that the surge hazard will evolve significantly during the 21 century.”

Stronger Storms?

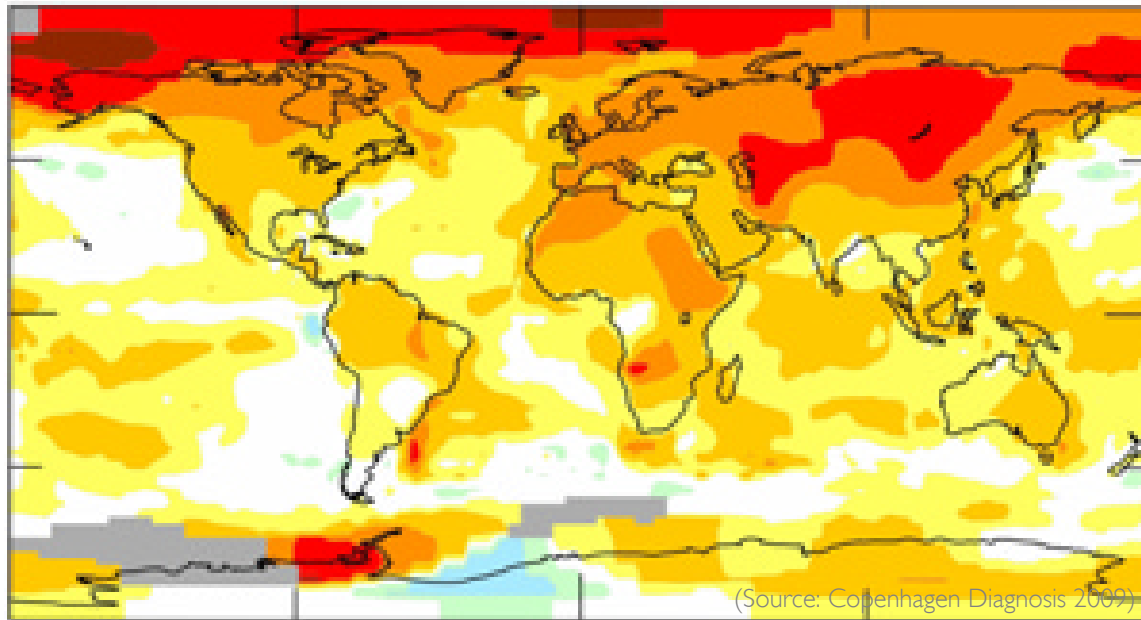



“What we are witnessing is not an aberration, but rather a ‘curtain raiser’ on the future. These events are not abnormal; they’re what I call the ‘new normal.’ The number of recorded disasters has doubled from approximately 200 to over 400 per year over the past two decades. Nine of out every ten disasters are now climate related. Last year, my office at the UN issued an unprecedented 15 funding appeals for sudden natural disasters, five more than the previous annual record. 14 of them were climate-related.”

—Sir John Holmes, UN Under-Secretary General for Humanitarian Affairs and Emergency Relief Coordinator.

Photo: Kirill Putchenko

Mean temperature change between 1950's and 2000's





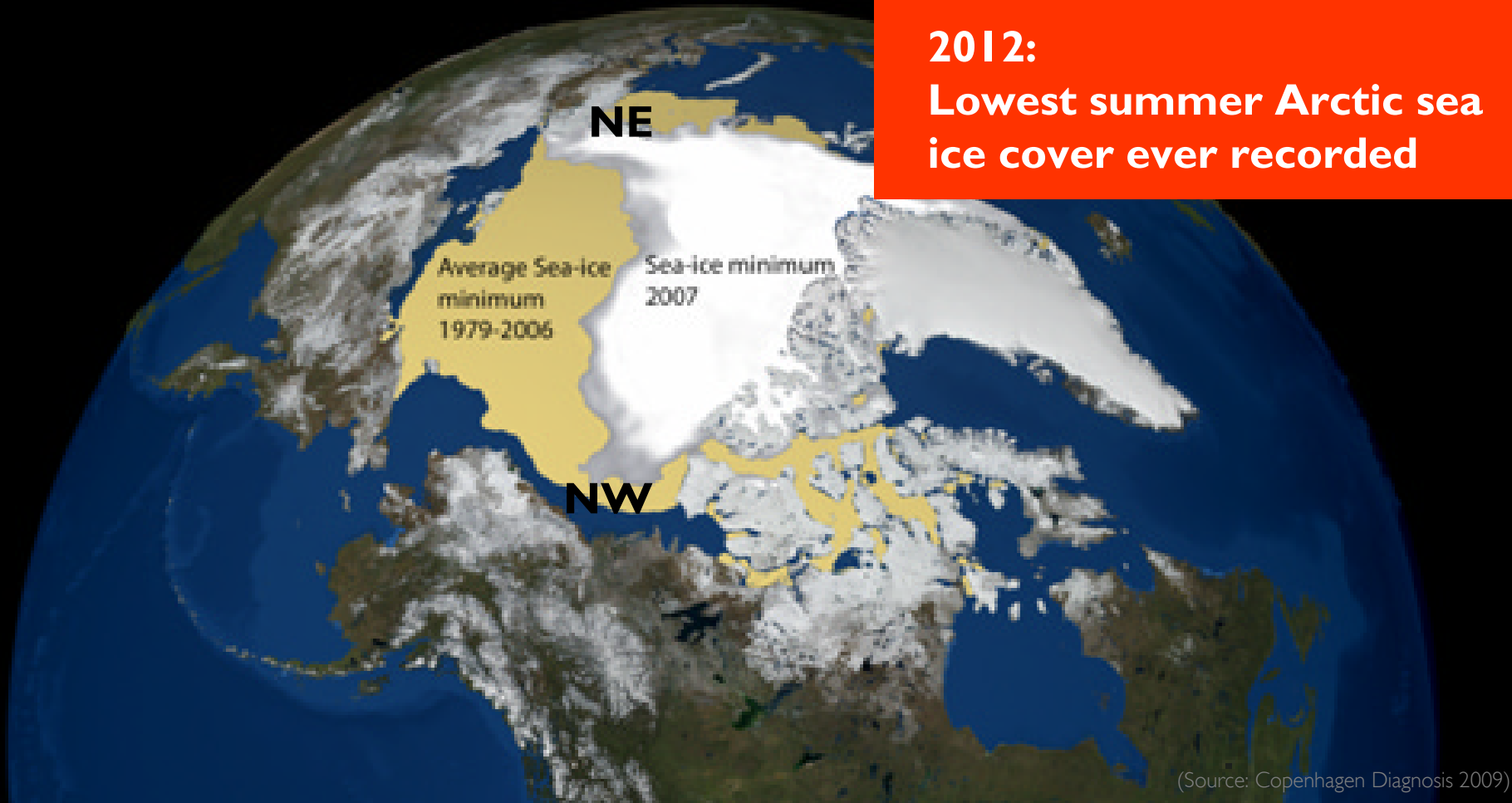
**Thermal
expansion:
40% sea level rise
(1961-2003)**

Photo: Tammy Peluso

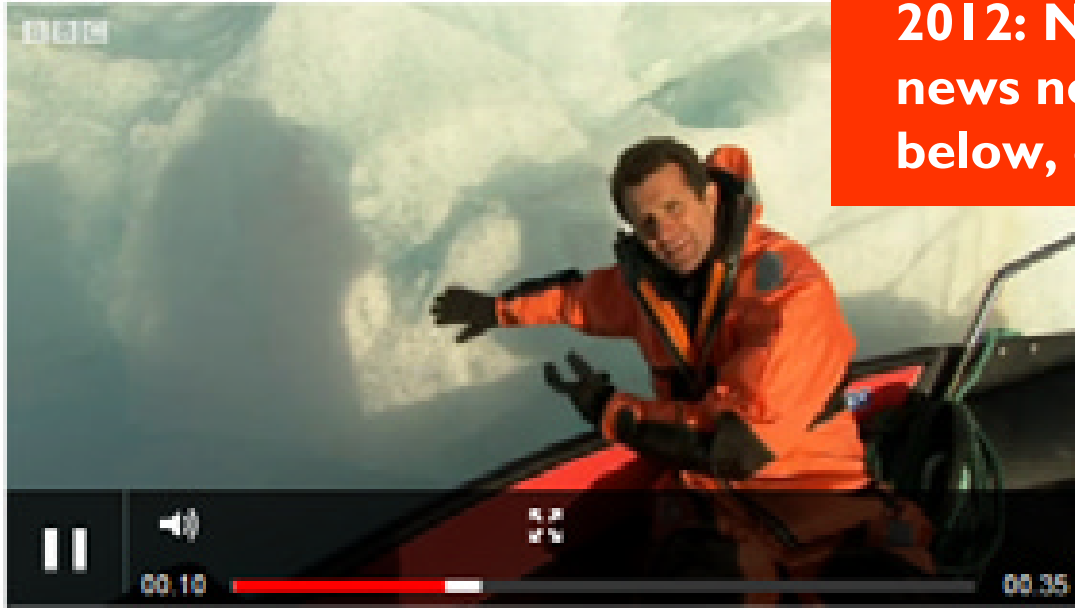


**Land-based
melting ice:
60% sea level rise
(1961-2003)**

Calving Glacier in the Polar Region
(Photo: Vera Bogaerts)



Minimum arctic sea-ice decline from 1979 to 2007



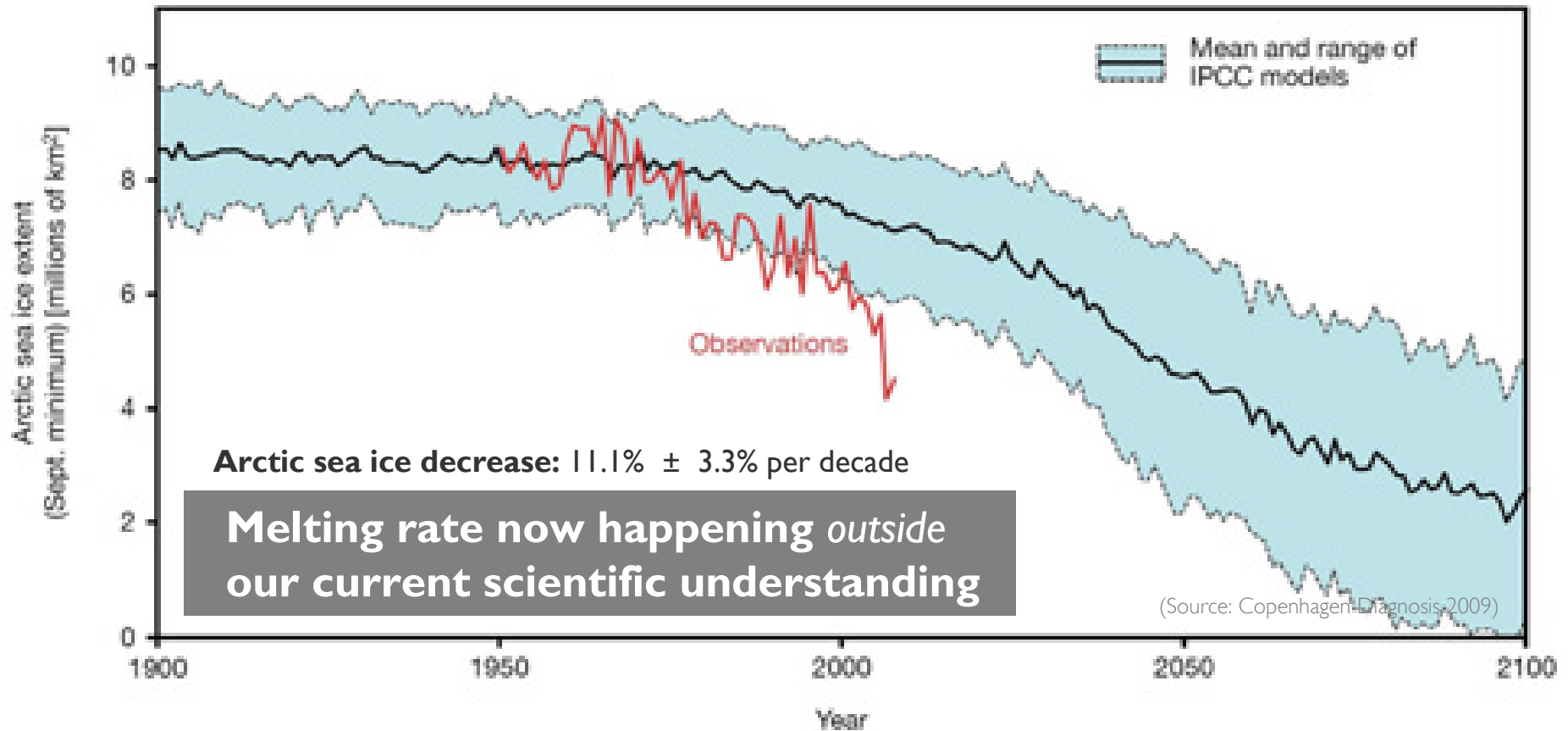
2012: New record, in the news now... (see video links below, only a few days old)

<http://www.bbc.co.uk/news/uk-19498018>

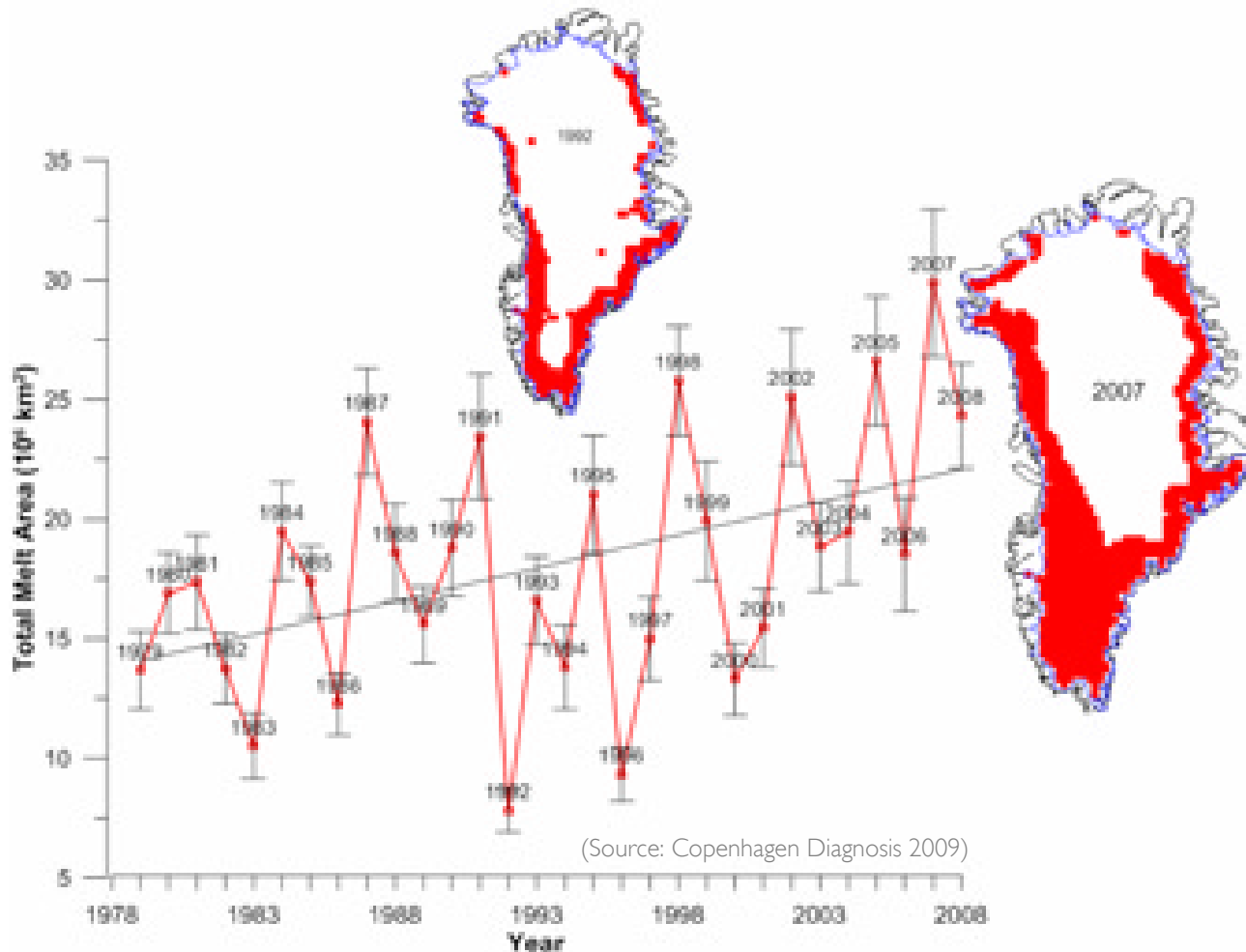
→ <http://www.bbc.co.uk/weather/features/19417327>

→ <http://www.bbc.co.uk/news/world-europe-19508906>

Observed and modeled Arctic sea-ice decline



Greenland ice-melt since 1979



2002-2009:
Greenland ice mass
loss doubled

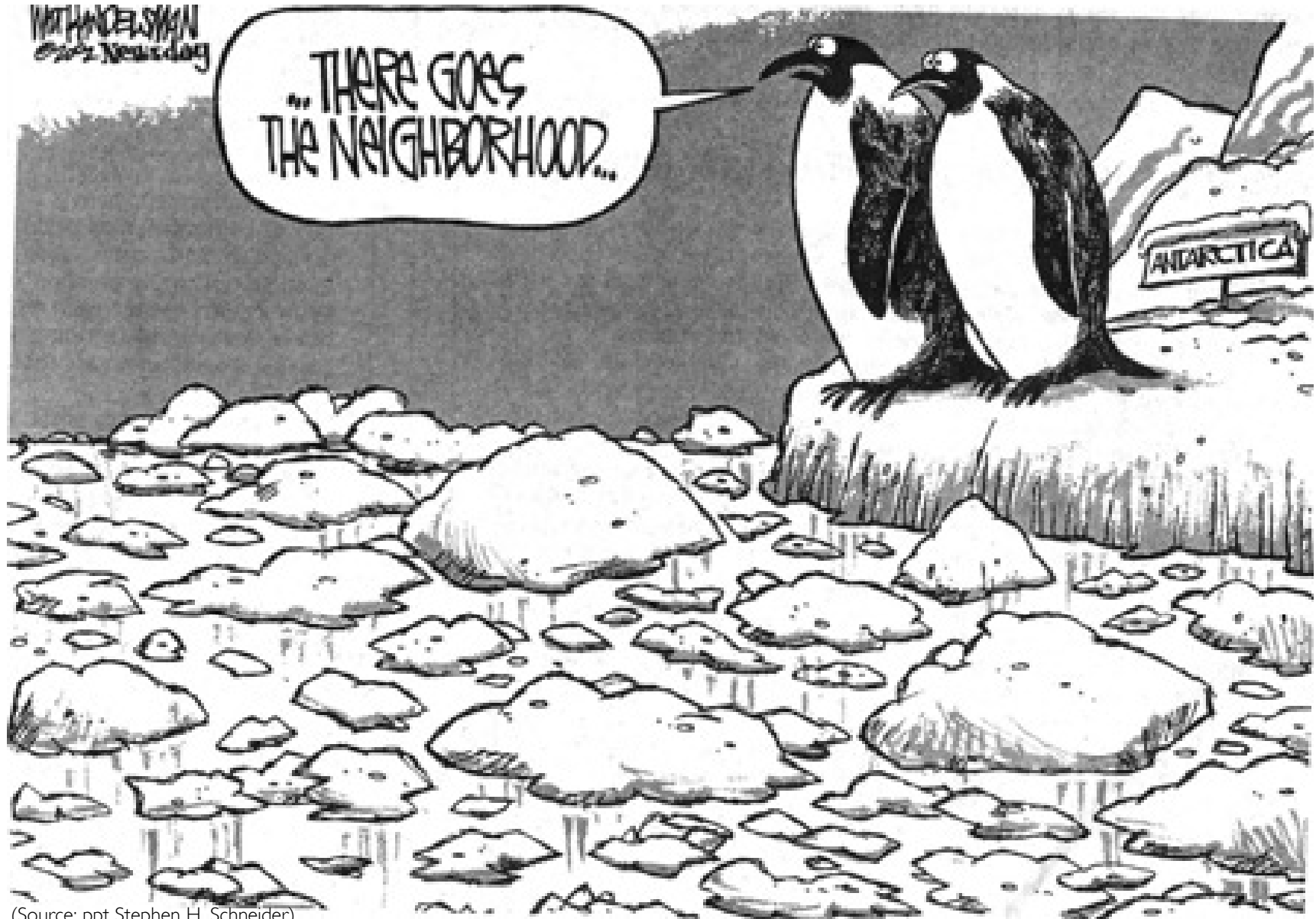
2007:
melting area 50%
of total ice sheet

6.6 metres:
Greenland's total
SLR potential

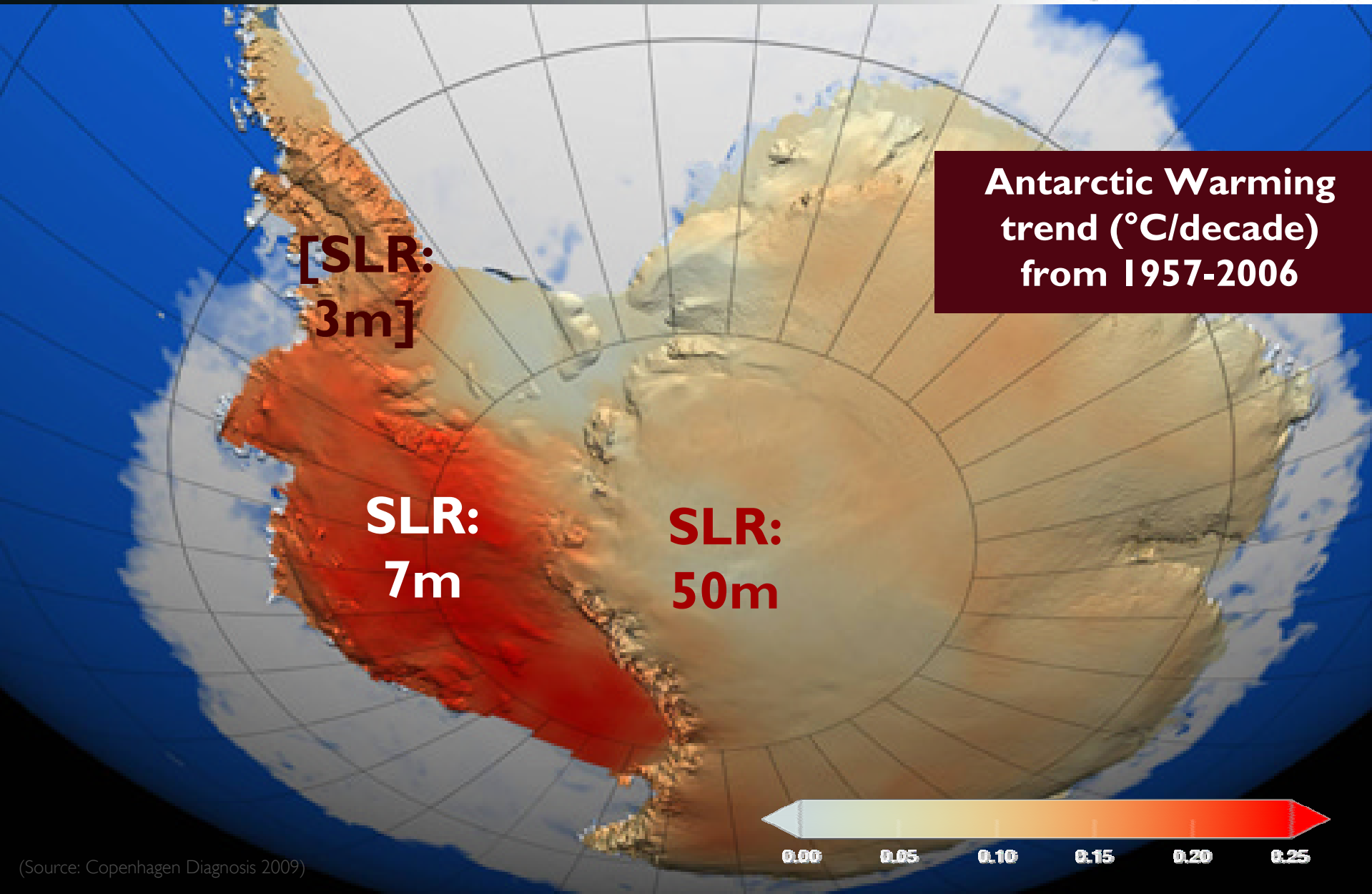
While Arctic sea-ice decline is sea level neutral, proximity to Greenland is a cause for concern

Ice-Free Arctic Summers?



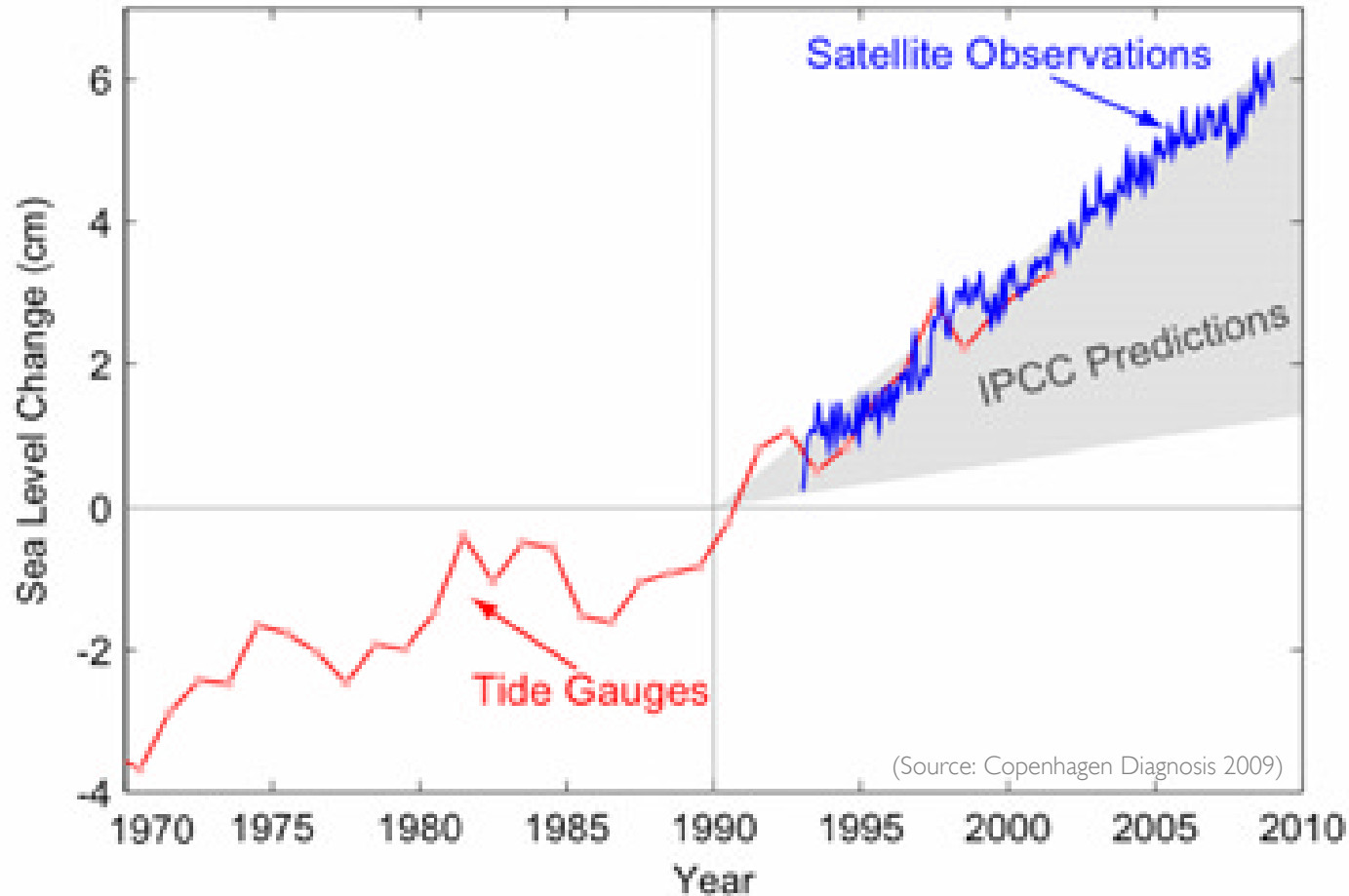


(Source: ppt Stephen H. Schneider)



(Source: Copenhagen Diagnosis 2009)

Global sea level change 1970-2010



**SLR by
2100:
1-2m**

**Last 15
years:
5cm SLR ~
80% faster
than IPCC**

**SLR by
2300:
up to 5m?**

Future sea level projections

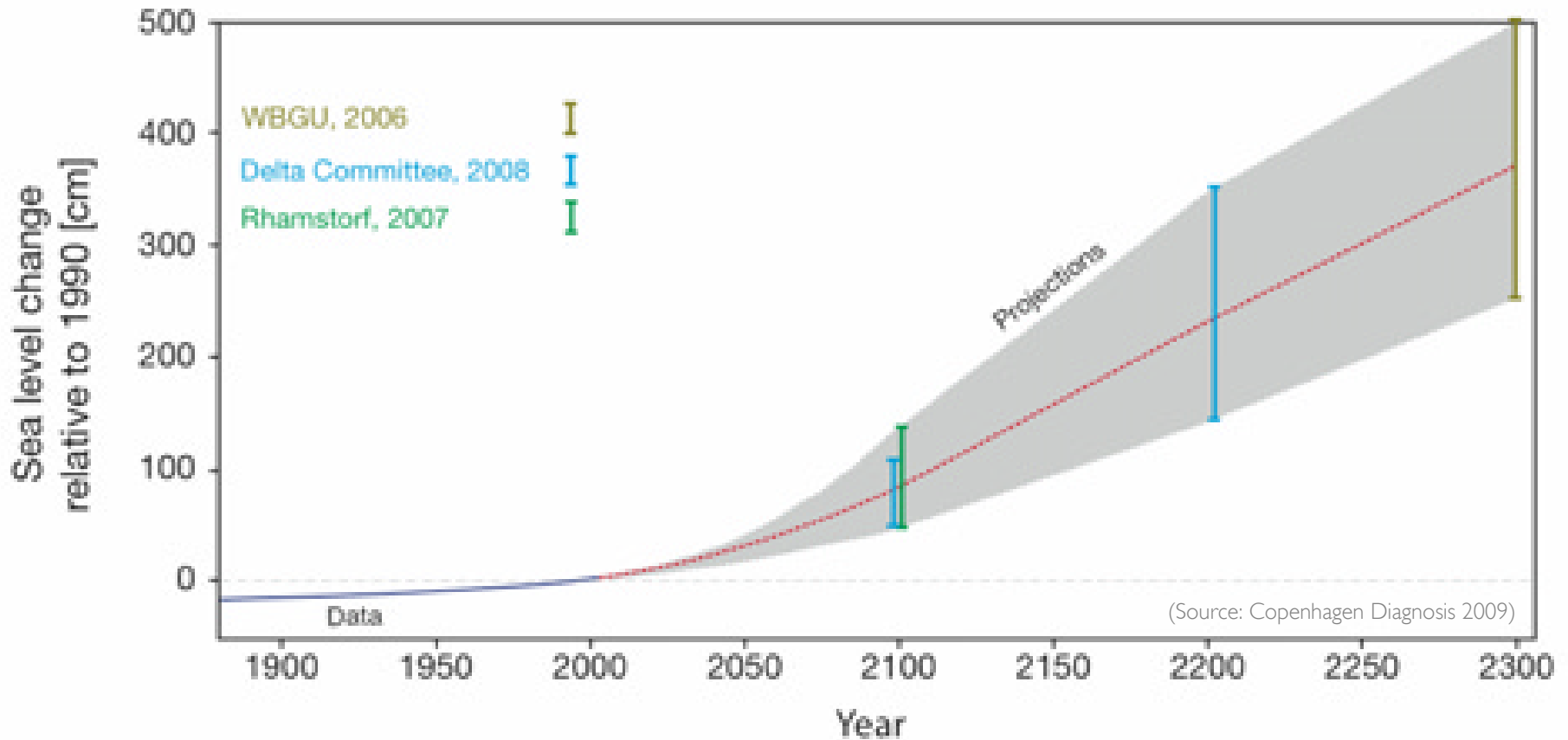
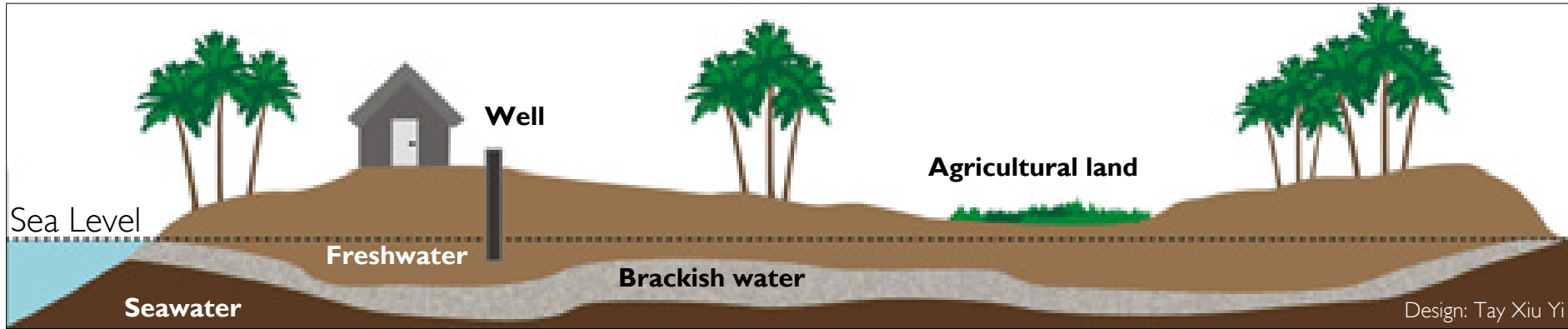
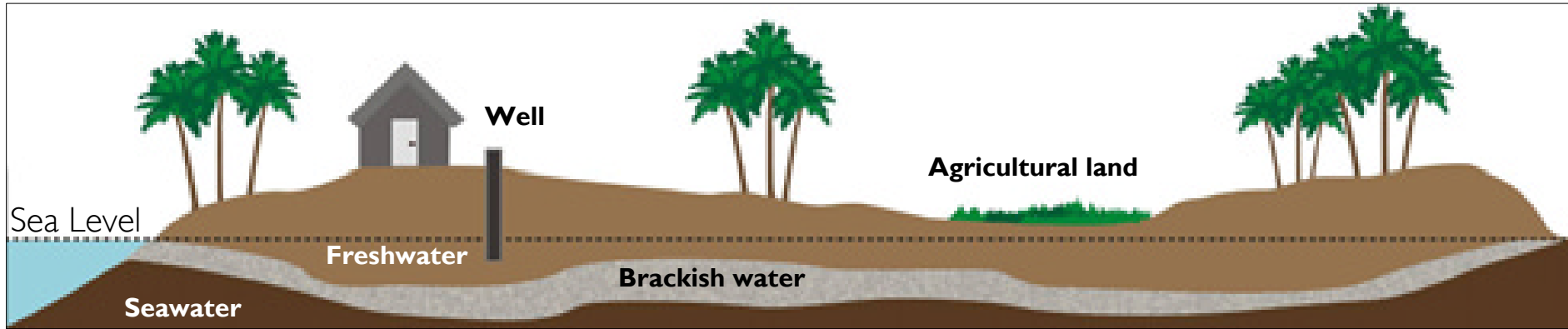


Figure 1: Initial sea level



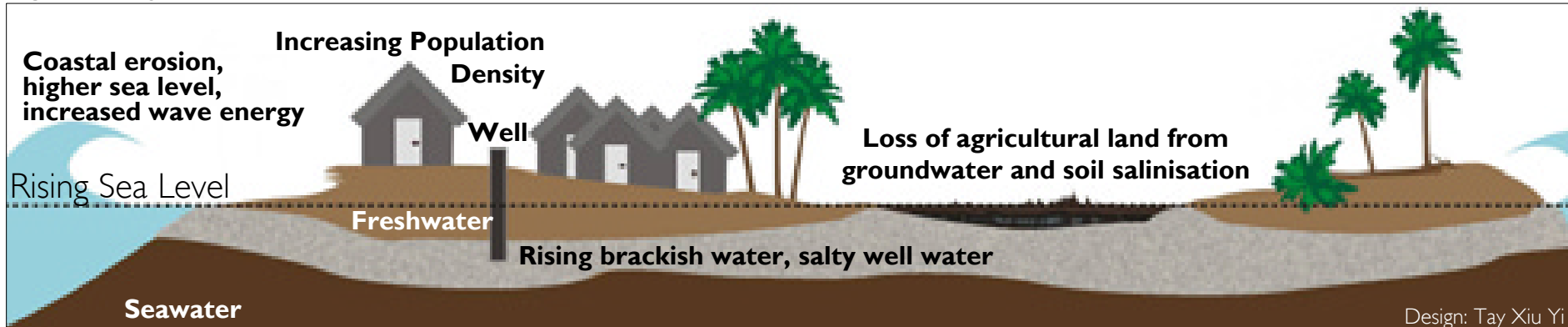
Island Submergence

Figure 1: Initial sea level



Island Submergence

Figure 2: Rising sea level



Design: Tay Xiu Yi



WATER
IS LIFE

Intergovernmental Panel on Climate Change (IPCC)

Island near Fiji (Photo: Wikipedia)

Fourth Assessment Report, 2007: “By mid-century, climate change is expected to reduce water resources in many small islands ... to the point where they become insufficient to meet demand during low-rainfall periods.”

“Overtopping”



TULUN ATOLL

Photos: Tulele Peisa, Courtesy Pip Starr and Ursula Rakova



Slicing through

TULUN ATOLL

Photos: Tulele Peisa, Courtesy Pip Starr and Ursula Rakova



Mosquito breeding swamps

TULUN ATOLL

Photos: Tulele Peisa, Courtesy Pip Starr and Ursula Rakova

Photo: Johannes Luetz



**Island of Petats:
Contaminated
Open Well**

Papua New Guinea: Island of Petats, contaminated open well

Luke Rutsie (36), Petats: “The well water tastes very salty – islanders now use it only for cooking and bathing.”

Island of Pororan: Contaminated Closed Well



Photo: Johannes Luetz

Papua New Guinea, island of Pororan,
contaminated closed well

Francis Giran (59), Pororan: “The well water has become salty and unfit for consumption. This World Vision-built pump is brown with rust.”

Climate change and small island states

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(Photo: Johannes Luetz)

“Our results reveal that hundreds of millions of people in the developing world are likely to be displaced by Sea Level Rise within this century.”

(World Bank Policy Research, 2007)



“
When we talk about a one metre rise in global sea level we are also talking about 500 million people who are going to have to look for new homes. So far we don't have any instruments to manage this.”

(Professor Hans Joachim Schellnhuber CBE, Director Potsdam Institute for Climate Impact Research, Chairman German Advisory Council on Global Change WBGU, Senior Advisor to the German Government, 2008)



Photo: Pamela Sitko

“If emissions follow a business-as-usual scenario, sea level rise of at least two meters is likely this century. Hundreds of millions of people would become refugees.”

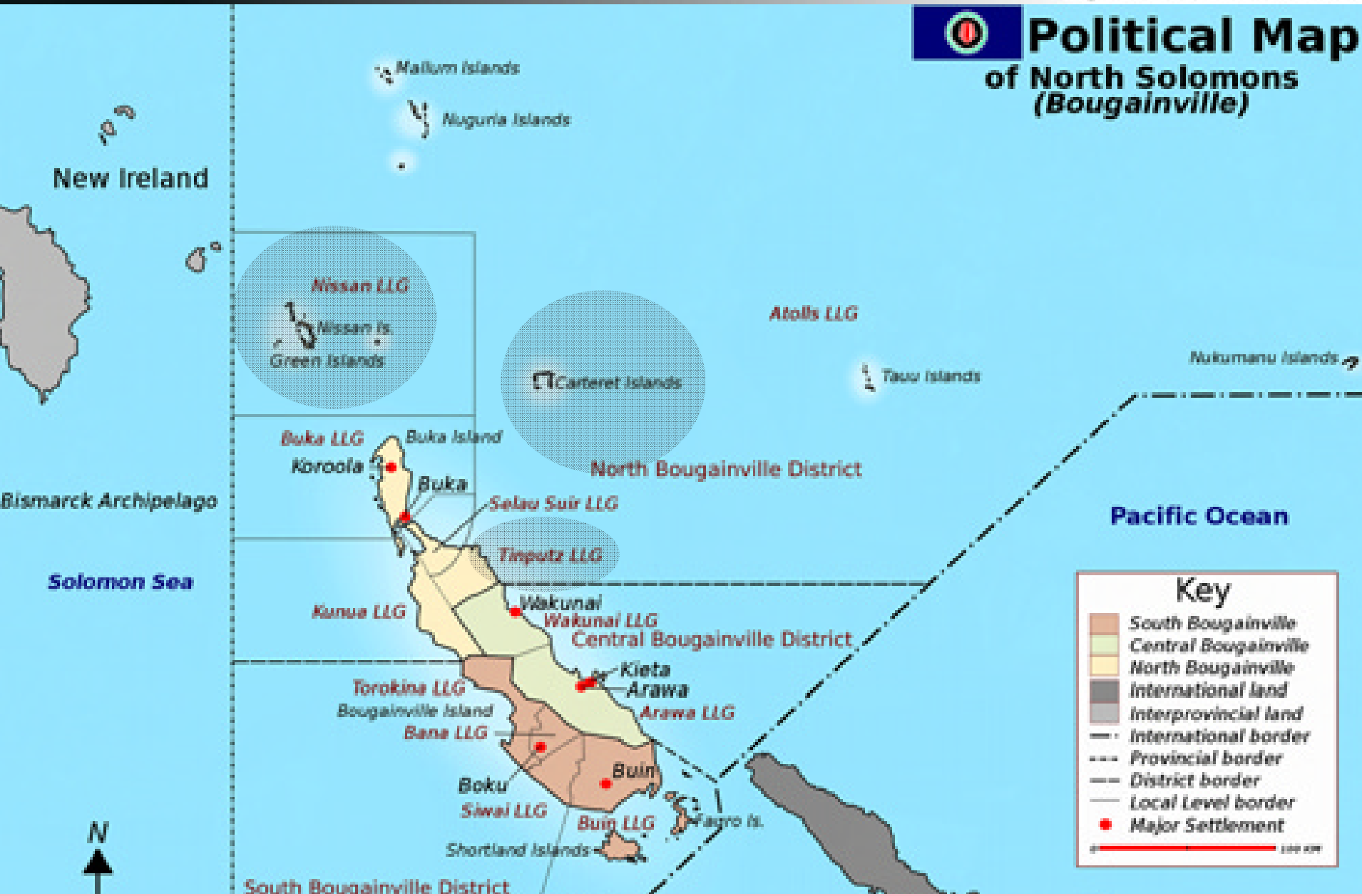
(Dr. James Hansen, Director NASA Goddard Institute, Adjunct Professor Columbia University)

How should such forced migration be managed ?



(Photo: Johannes Luetz)

Political Map of North Solomons (Bougainville)



Key	
	South Bougainville
	Central Bougainville
	North Bougainville
	International land
	International border
	Provincial border
	District border
	Local Level border
	Major Settlement
0 100 km	



There once was an island (trailer feature documentary)

<http://youtu.be/M7akwGUtGDw>

- Semi-structured interviews
- Trial data generation
- Observe issues raised
- Focus questionnaire



Carteret Atoll, Papua New Guinea



Carteret Islander and Director of Tulele Peisa NGO, Papua New Guinea

Photo: Pip Starr

Ursula Rakova: “Storm surges regularly overtop our islands – then the sea and low-lying land become ‘level.’ Resettlement is underway. It is so sad to leave.”

Huene Island, Tulun Atoll



(Photo: Johannes Luetz)





Climate change and small island states

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Island of Buka

Photo: Johannes Luetz

ISLAND ADAPTATION THROUGH SEA WALLS?



Photo: Pip Starr

Show field research video footage:

File PNG I:

- 18:00 (1min) – Han Island
- 19:20 (15sec) – drowning trees
- 22:45 (45sec) – coconut, land lost
- 26:00 (30sec) – flooded sea walls

ISLAND ADAPTATION THROUGH SEA WALLS?



<http://www.vimeo.com/4177527>



The President's Dilemma

<http://youtu.be/nZLWqa5irog>

Circling Han Island in “banana boat” – coconut tree stump, evidence of sea level rise and diminishing island size ...



“

This [is] about the injustice of sea level rise ... on average you have about a metre of sea level rise by 2100, ... all over the globe. But the ... very vicious thing is, that this sea level rise will be distributed in a highly inhomogeneous way across the planet. [...] Elementary physics – if Greenland is losing mass, that means its gravitational pull for seawater will be diminished – that means, around Greenland, sea level may even drop, in particular for the north-eastern part of the American continent, while ... the Pacific Islands ... that haven't done anything to contribute to global warming, will again get the brunt of it, will get all the water which is released from Greenland. [...] And those who are most responsible for that, northern Europe, northern America, will be spared sea level rise, at least for a while. So you see nature can be extremely unfair, if humanity is sort of provoking that injustice.

”

Professor John Schellnhuber CBE, Director Potsdam Institute for Climate Impact Research, Chairman German Advisory Council on Global Change WBGU, Senior Advisor to the German Government, Session 1 at ~ 51:00
@ <http://www.fourdegrees2011.com.au>



Environment and non-environment related drivers reinforce each other




Malé, Maldives

Malé, Maldives: As the country with the lowest "highest point" on Earth the Maldives is extremely vulnerable to rising sea levels, 80% of land area is less than 1 metre above sea level. (Photo: Shahee Ilyas)

Mohamed Nasheed, President Maldives, 2009:

“We do not want to leave the Maldives, but we also do not want to be climate change refugees living in tents for decades.”

Dhuvafaaru, Maldives



Island of Dhuvafaaru, Maldives
(Photo: Johannes Luetz)



Dhuvafaaru, Maldives

Island of Dhuvafaaru, Maldives
(Photo: Johannes Luetz)



Dhuvaafaru, Maldives

Island of Dhuvaafaru, Maldives
(Photo: Johannes Luetz)



Show field research video footage:

File name “Maldives 4”:

04:00 (1 min) – Abandoned Hathifushi Island

23:00 (1 min) – Skipper, stuff, storm surge

48:00 (1 min) – Faridhoo: highest point on M.

Island of Hathifushi, Maldives
(Photo: Johannes M Luetz)



Show field research video footage:

File name “Maldives 5”:

40:00 (7min) – Minister Aslan Interview

File name “Maldives 6”:

18:30 (45sec) – Hulhumalé from the air

(Photo: Wendy Barrón Pinto)

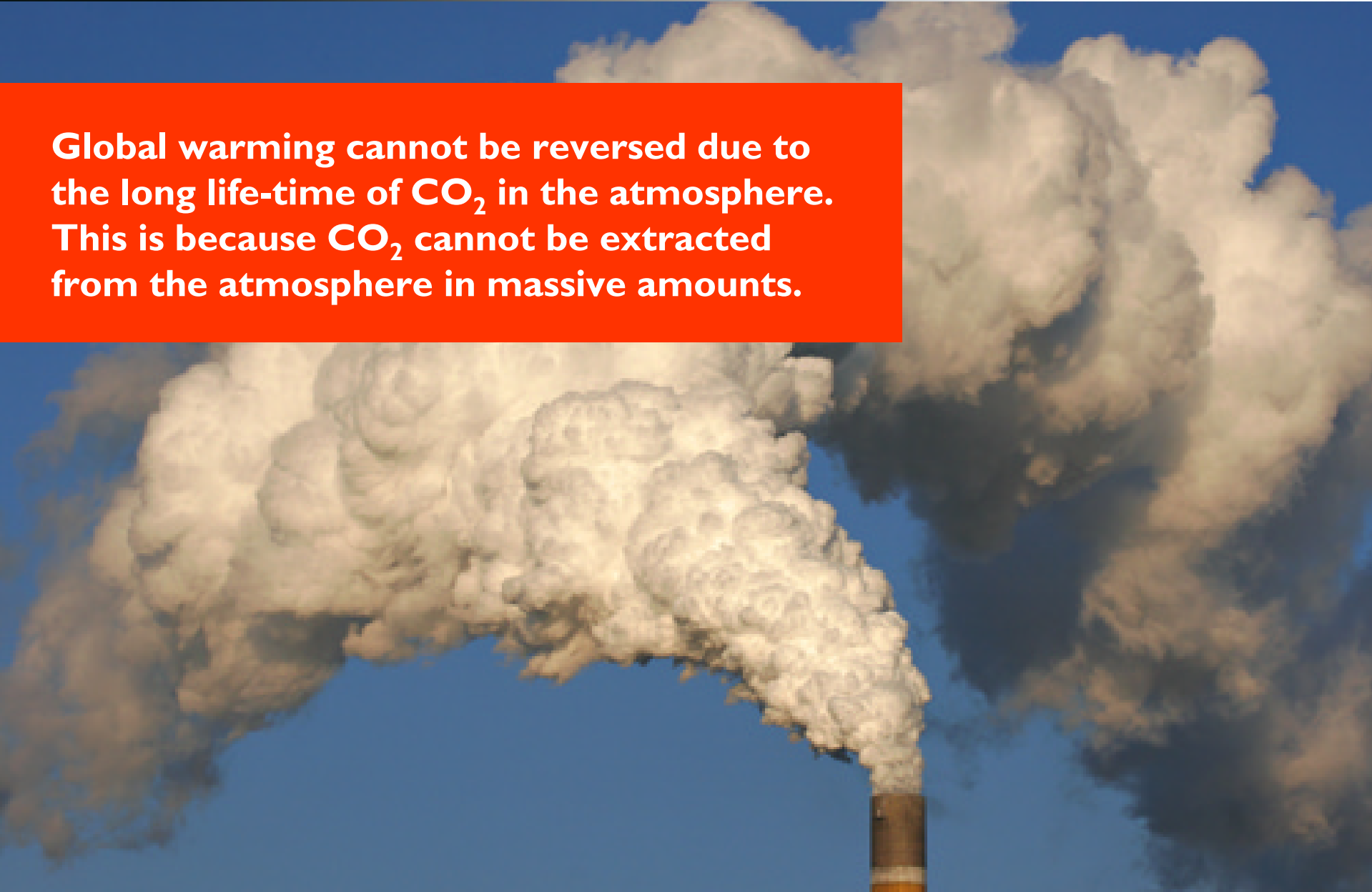
Climate change and small island states

1. Climate Change Science
2. Impacts
3. Research Problem and Methodology
4. Discussion
5. **Conclusion and Policy Recommendations**

“ There is a window of opportunity for avoiding the most damaging climate change impacts, but that window is closing: the world has **less than a decade** to change course. Actions taken – or not taken – ...will have a profound bearing on the future. ”

2007/2008 UN Human Development Report

Global warming cannot be reversed due to the long life-time of CO_2 in the atmosphere. This is because CO_2 cannot be extracted from the atmosphere in massive amounts.





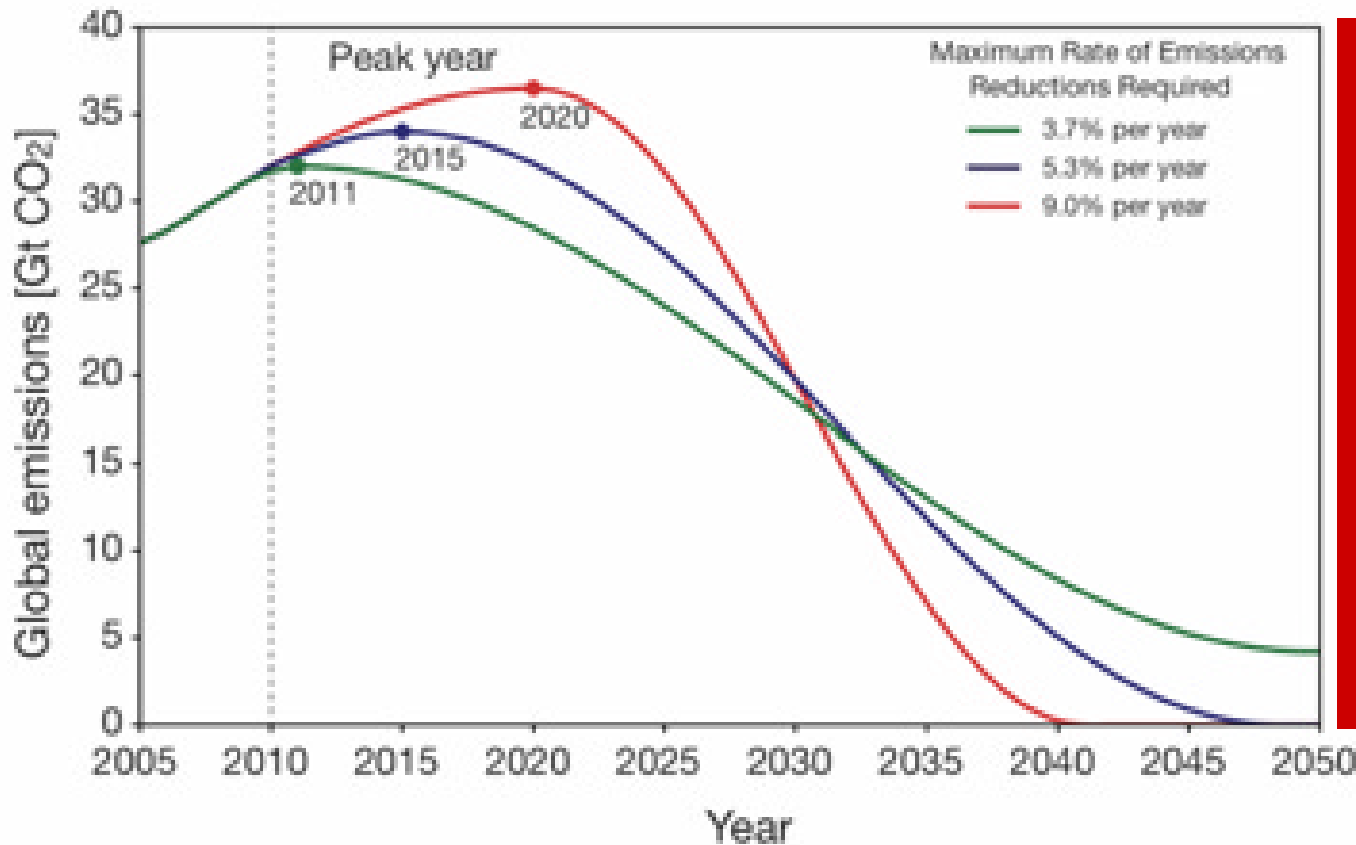
Global warming can be completely stopped. The temperature at which global warming will finally stop depends mainly on the total amount of CO₂ released into the atmosphere since industrialisation.

**The sooner
emissions stop,
the lower the
final warming
will be.**

**Zero Emissions?
Zero Regrets!**



Exemplary emissions pathways which remain within 750Gt and leave a 67% chance of limiting global warming to 2°C



750Gt – 2050

By 2050, annual per capita emissions very likely will need to be below 1 ton.

Solving the climate dilemma: The budget approach; WBGU Special Report 2009

Annual per-capita CO₂ emissions below 1 ton

A decarbonised global society with near-zero emissions of CO₂ needs to be reached by 2050 (1 Person = 1t CO₂)





Energy Efficient Penguin: http://youtu.be/_kocZ-j-o3I



Global Warming's Terrifying New Math | Politics News | Rolling Stone - Mozilla Firefox

Global Warming's Terrifying New Math (Polit...

www.rollingstone.com/politics/news/global-warmings-terrifying-new-math-20120719

Global Warming's Terrifying New Math

Three simple numbers that add up to global catastrophe - and that make clear who the real enemy is

5348



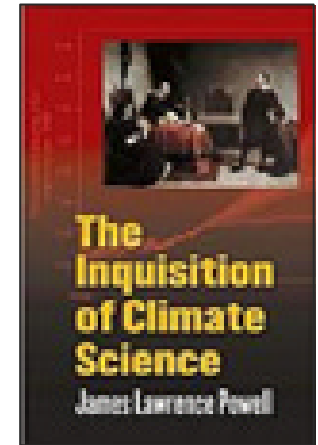
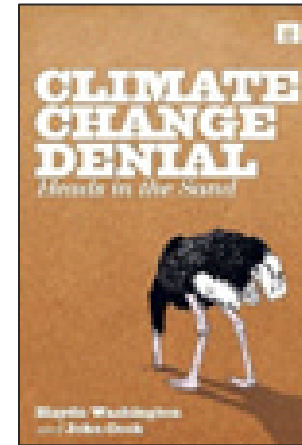
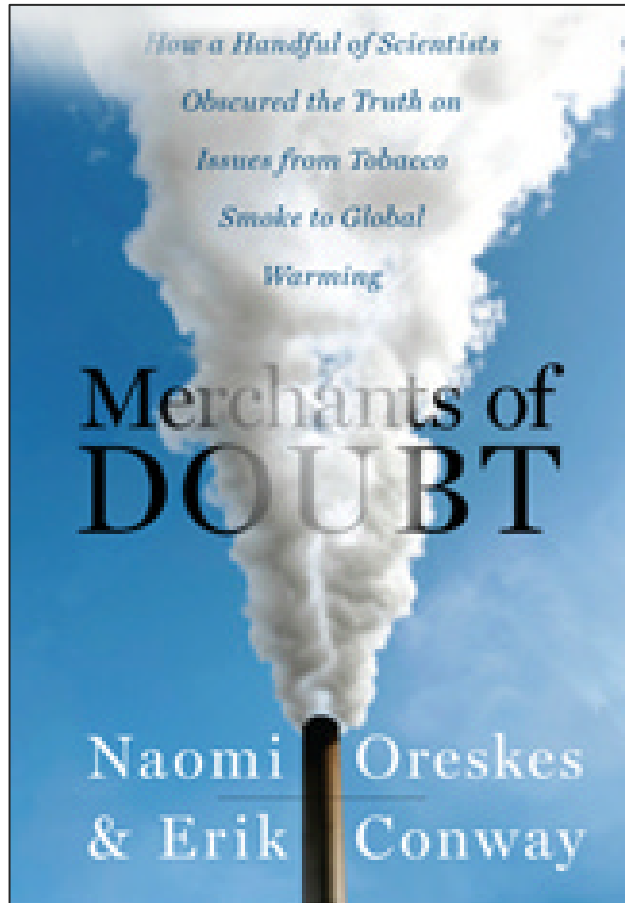
Illustration by Elia Rodriguez

By **BILL MCKIBBEN**
JULY 19, 2012 6:11 AM ET

Bill McKibben:

**Global Warming's
Terrifying New
Math**

■ <http://www.rollingstone.com/politics/news/global-warmings-terrifying-new-math-20120719>

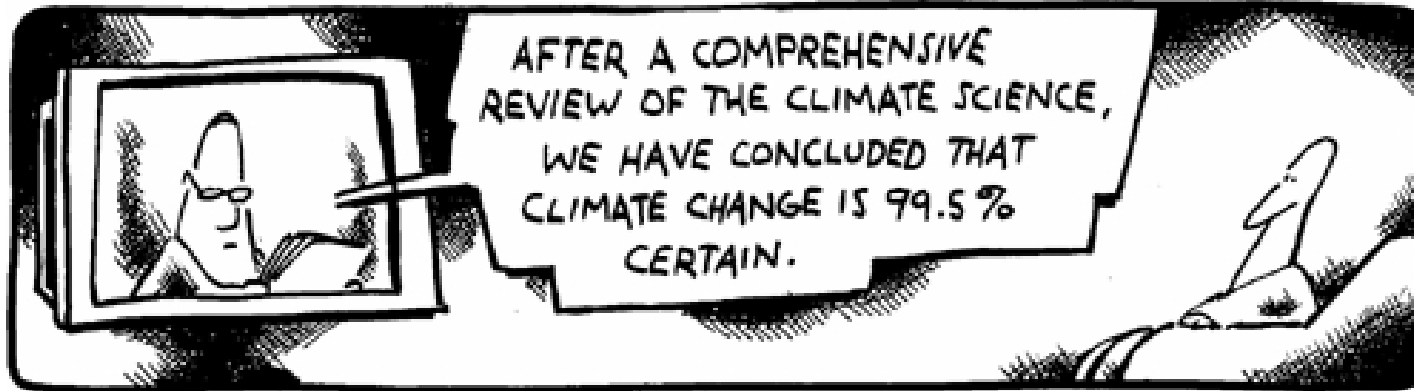


→ <http://www.merchantsofdoubt.org/>

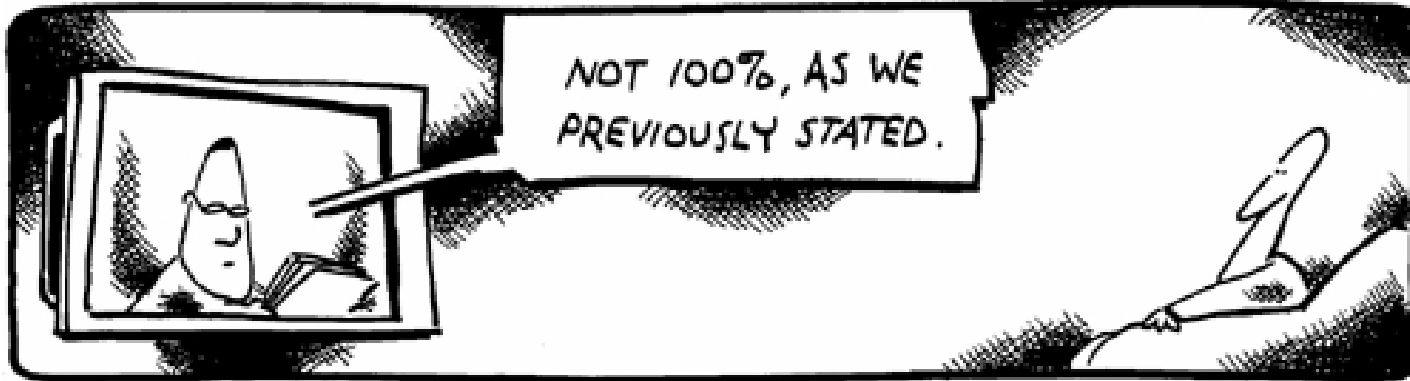
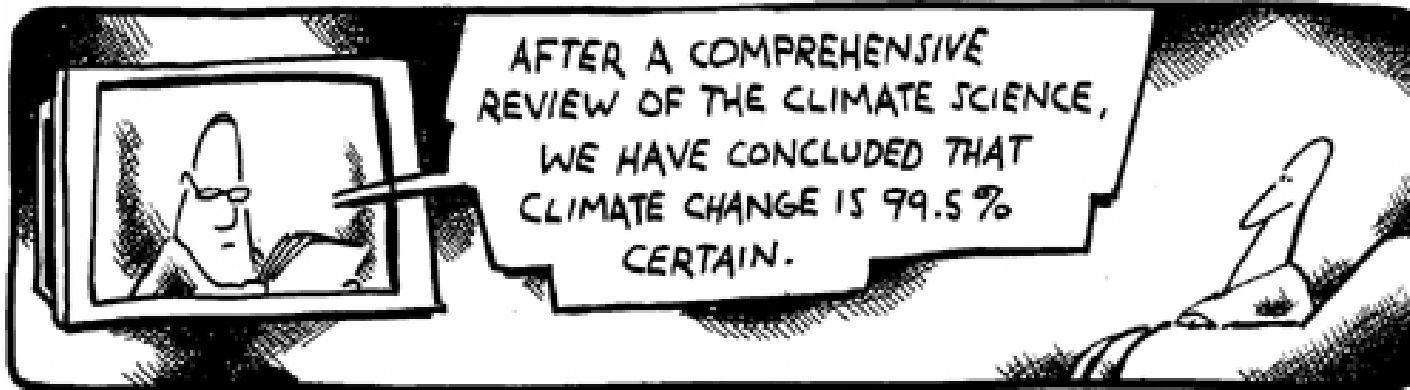
→ <http://youtu.be/YhDacrIlaSA>



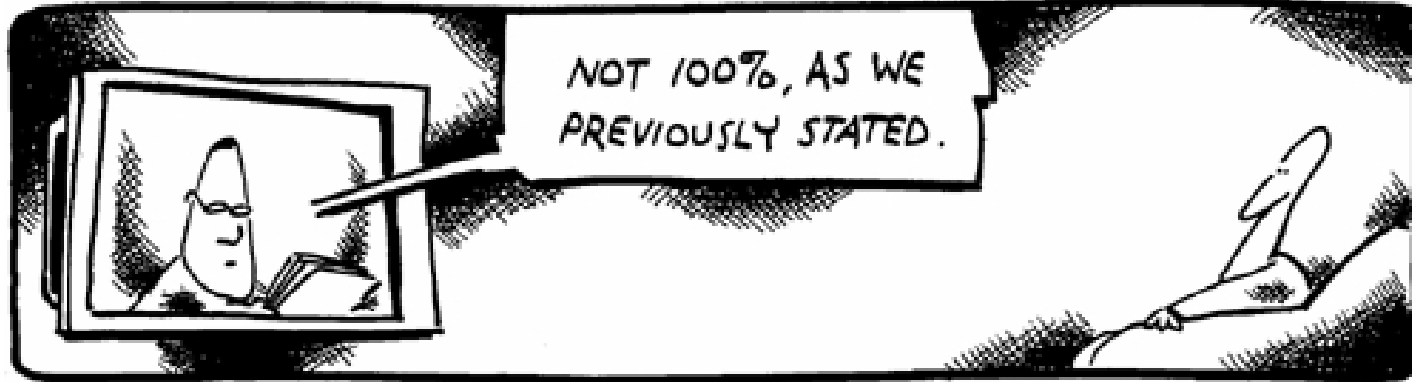
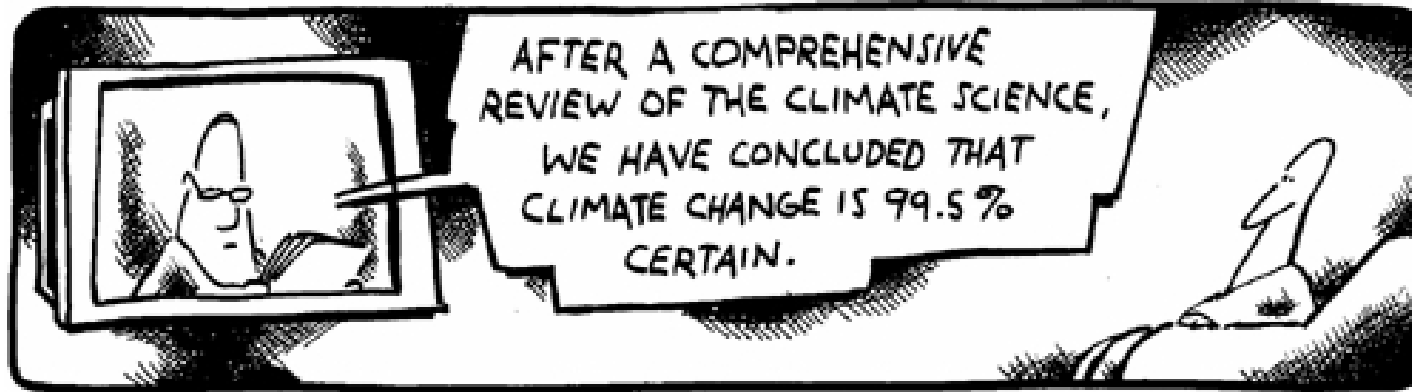
(Source: ppt
Stephen H. Schneider)



(Source: ppt
Stephen H. Schneider)



(Source: ppt
Stephen H. Schneider)

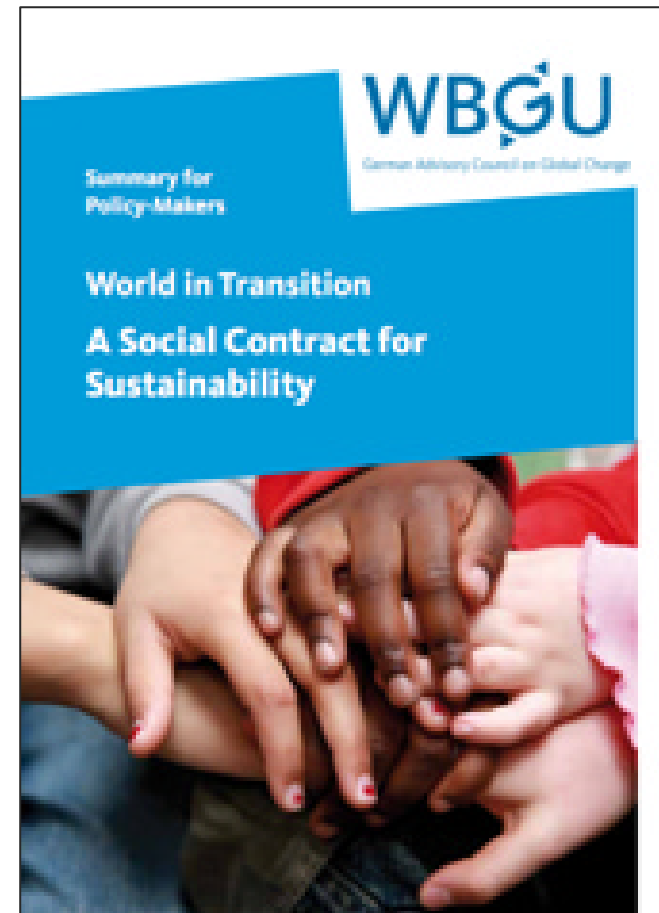


(Source: ppt
Stephen H. Schneider)

World in Transition: Social Contract for Sustainability

Flagship Report 2011

<http://www.wbgu.de/en/home>



“Great Transformation”



Free online university seminar: <http://www.wbgu.de/en/trafoseminar/>

“ The climate change that the world is already locked into has the potential to result in large-scale development setbacks, first slowing, then stalling and reversing progress in poverty reduction, nutrition, health, education and other areas ...

Hoping – and working – for the best while preparing for the worst, serves as a useful first principle for adaptation planning. ”

—2007/2008 UN Human Development Report:
Fighting climate change : Human solidarity in a divided world.



Climate Adaptation Masterclass

NCCARF
National Climate Change Adaptation Research Framework

Friday 20 May 2011, Queensland Museum, Brisbane

The workshop
The event aims to build Australian understanding and capacity by providing researchers and decision-makers with the latest international thinking on climate change adaptation. The workshop will feature some of the world's leading climate change adaptation thinkers and practitioners.

Who should attend?
Researchers, policy and decision makers, especially those in their early and mid careers.

Sessions and speakers

- Defining and assessing complexity**
Malin Falkenmark, Stockholm Environment Institute, Sweden (FINO)
- The process of scientific learning and scientific assessment in high problems of global change**
Linda A. Robinson, Melbourne
Jon Barnett, University of Melbourne, Australia
Risk and Resilience Management
Maarten van Aalst, Radboud University Nijmegen, Netherlands
Living Under Uncertainty and Living with Change
Thomas Hilborn, San Diego State University, USA
- Bridging the science-policy interface**
Suzanne Halpern, Suzanne Halpern Research & Consulting, USA
- Resilient responses: reducing risk or uncertainty?**
Lars Ripstein, Stockholm Environment Institute, Sweden
- Gender and climate change**
Maureen Fryden, Northumbria University, UK
- Preparing adaptation and implementation**
Michael Hilborn, James Cook University, Australia
- Adaptive management of water resources**
Torge Arntsen, University of Twente, UK (FINO)

Register now!
Places in the masterclass are strictly limited and available on a first-come basis. A registration fee of \$50 is payable at the time of booking. Reserve your place in the masterclass event at <http://register.unsw.edu.au/nccarf>

Available resources:

- Audio files
- Presentation files

Masterclass

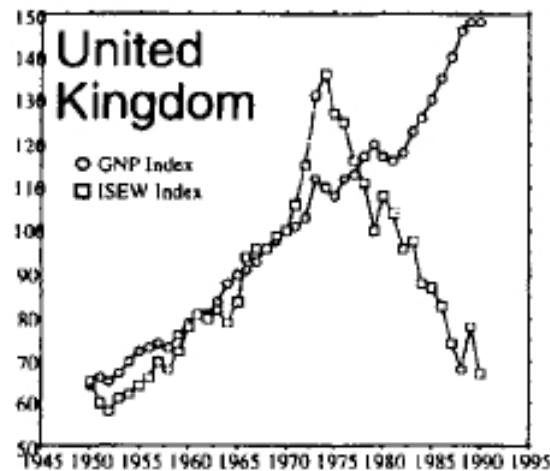
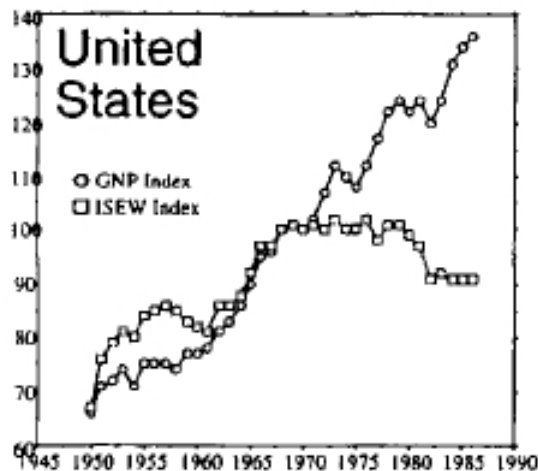
20 May 2011, Brisbane

FROM THEORY TO IMPLEMENTATION

<http://www.nccarf.edu.au/content/masterclass-climate-adaptation-theory-implementation>

Economic growth and quality of life: A threshold hypothesis

“... for every society there seems to be a period in which economic growth (as conventionally measured) brings about an improvement in the quality of life, but only up to a point – the threshold point – beyond which, if there is more economic growth, quality of life may begin to deteriorate.” (Max-Neef 1995; Genuine Progress Indicators GPI; Index of Sustainable Economic Welfare ISEW; Environment and Sustainable Development Indicators ESDI)



Our Common Future: Brundtland Report 1987, pp 24-25

27. *Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs...*

28. Meeting essential needs requires not only a new era of economic growth for nations in which the majority are poor, but an assurance that those poor get their fair share of the resources required to sustain that growth...

29. Sustainable global development requires that those who are more affluent adopt life-styles within the planet's ecological means – in their use of energy, for example. Further, rapidly growing populations can increase the pressure on resources and slow any rise in living standards...

30. Yet in the end, sustainable development is not a fixed state of harmony, but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs. We do not pretend that the process is easy or straightforward. Painful choices have to be made. Thus, in the final analysis, sustainable development must rest on political will.

***“When it comes to the future,
there are three kinds of people:
those who let it happen, those who
make it happen, and those who
wonder what happened.”***

(John M. Richardson, Jr., American Academic, born 1938)

Thank You! PhD Sponsors:





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