El AR5 del IPCC desde la perspectiva del WG II en relación a los impactos sobre la biodiversidad y los bosques

José M. Moreno
Departamento de Ciencias Ambientales
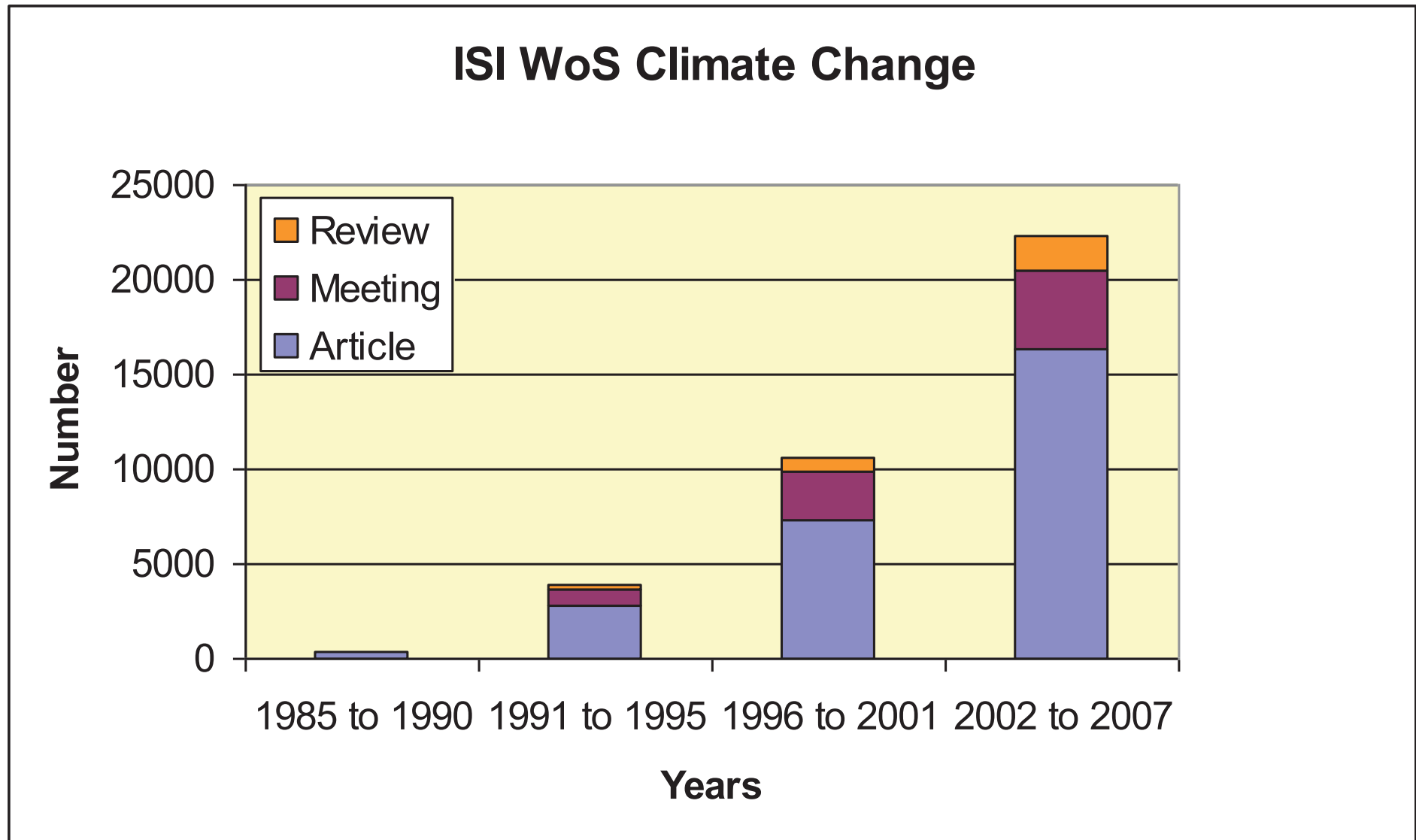**Universidad de Castilla-La Mancha**
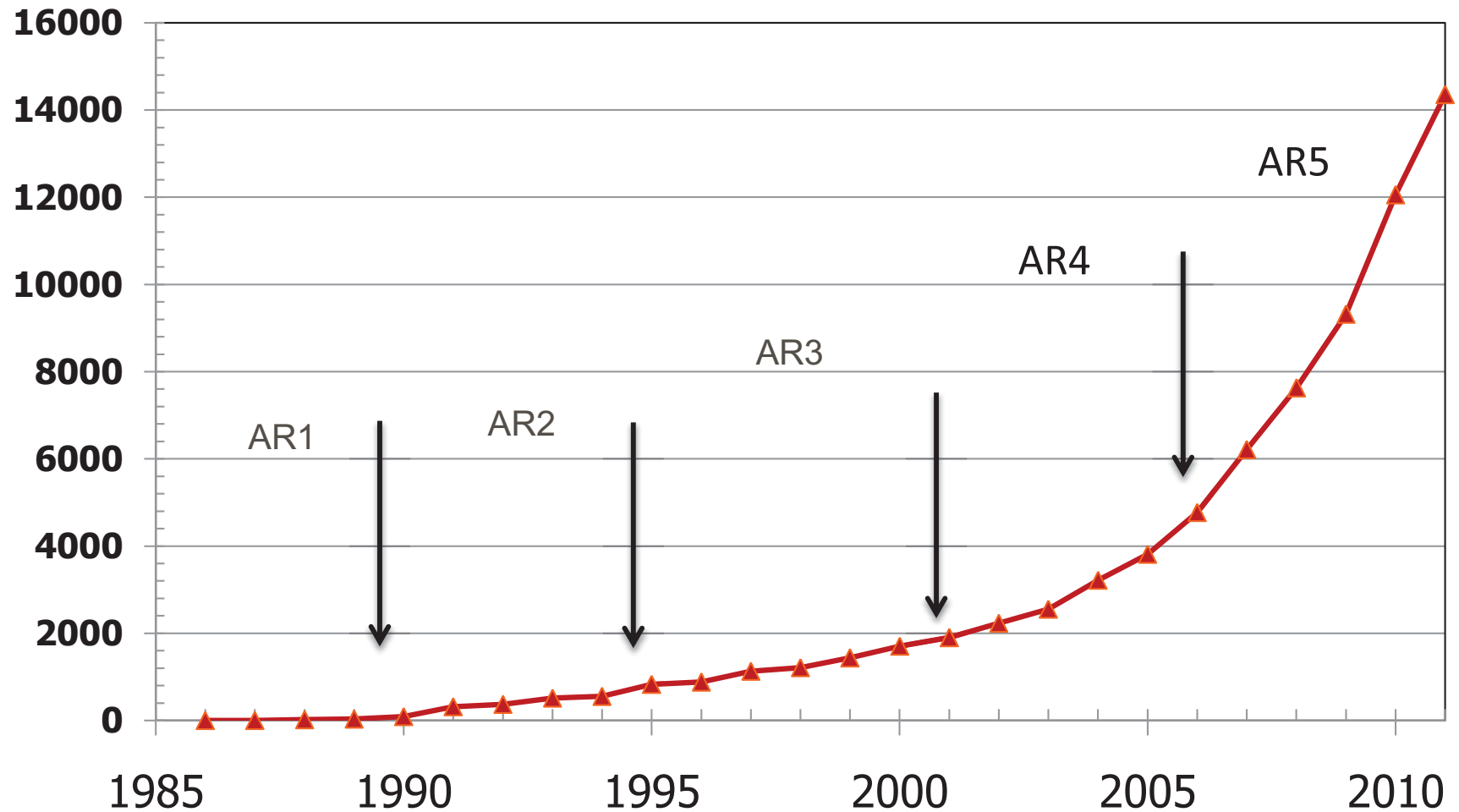**Toledo**

UCLM

El Reto del IPCC....

y la oportunidad de España

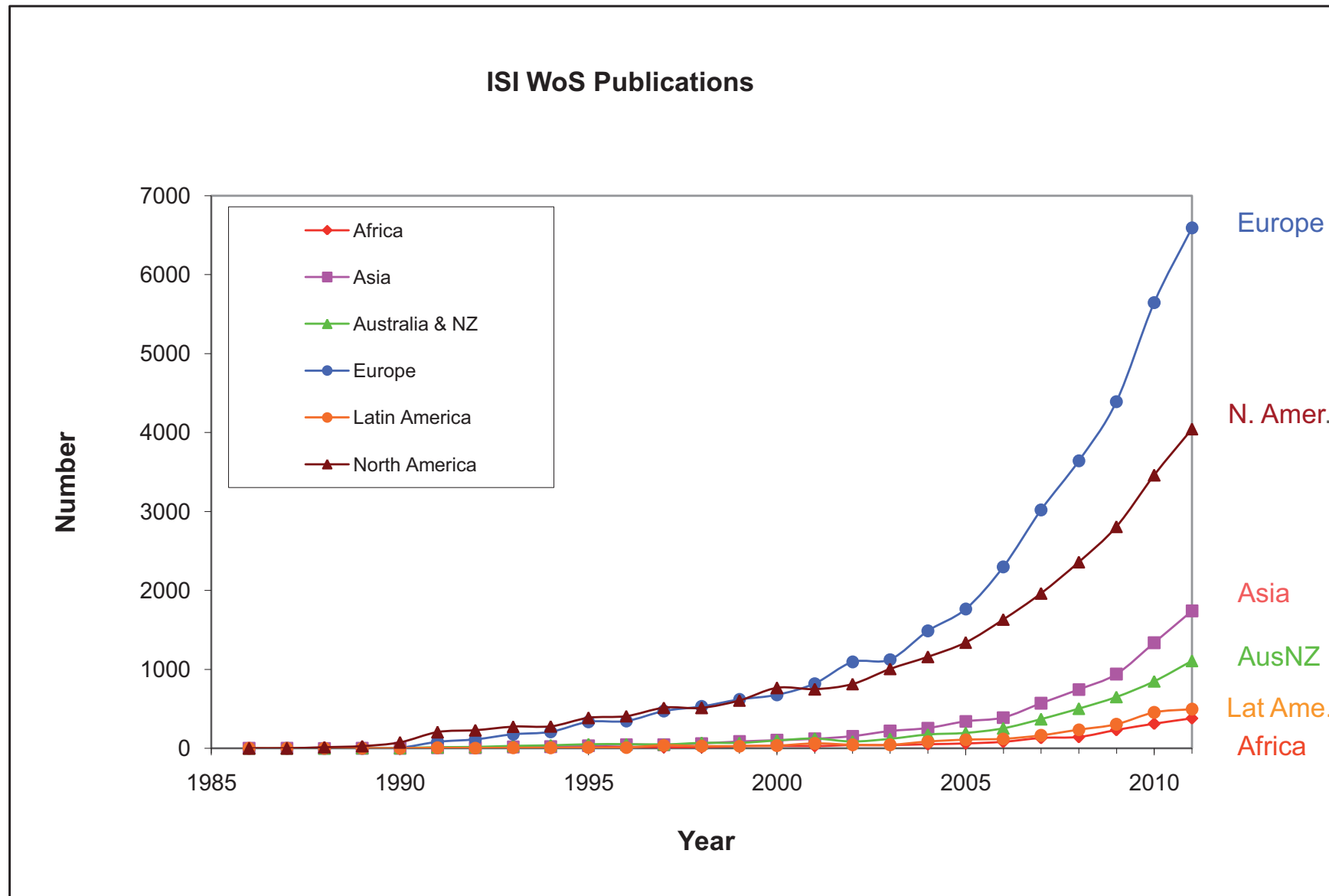# La información se ha más que duplicado en cada informe

ISI WoS Climate Change

.... y sigue creciendo (pub/a)

Total Publications

Desigualdad entre países

ISI WoS Publications

Pubs. por países (No./a)

Legend (top to bottom):
- Portugal
- España
- Venezuela
- Uruguay
- Perú
- Panamá
- México
- Ecuador
- Cuba
- Costa Rica
- Colombia
- Chile
- Brasil
- Bolivia
- Argentina

Y-axis: 0, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100

X-axis: 1986, 1991, 1996, 2001, 2006, 2011
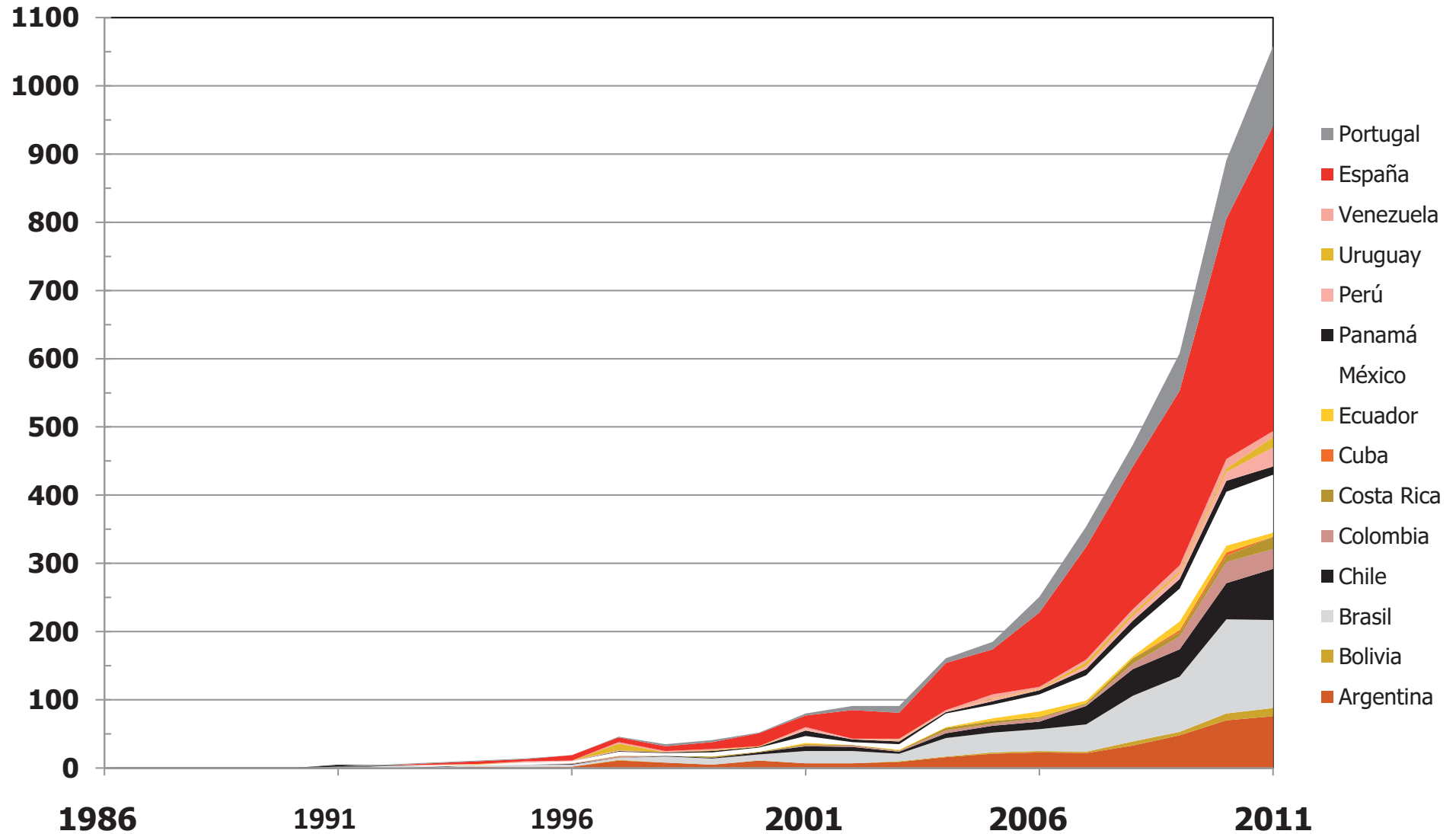
Publicaciones sobre el total mundial (%)

Países RIOCC

2003-2007

España
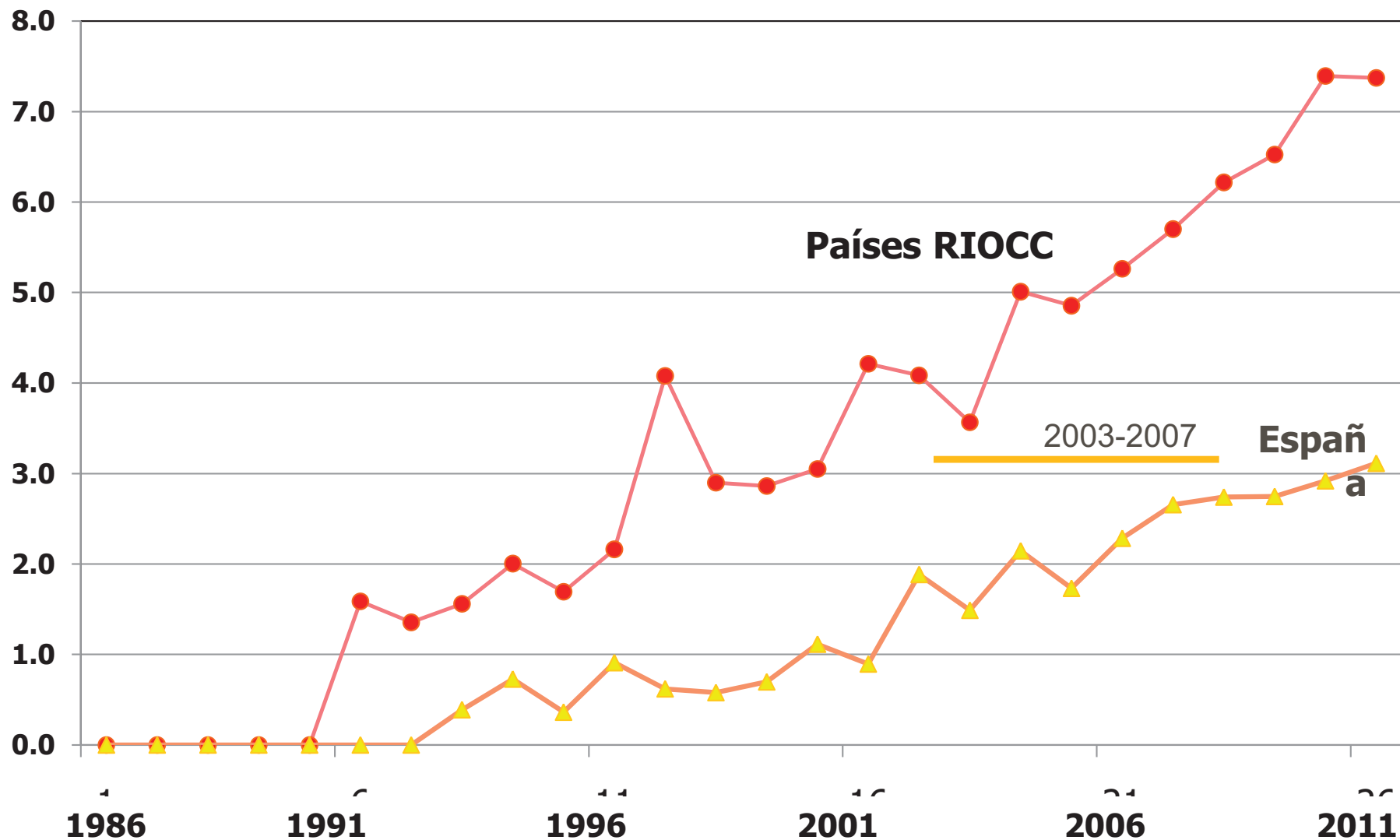
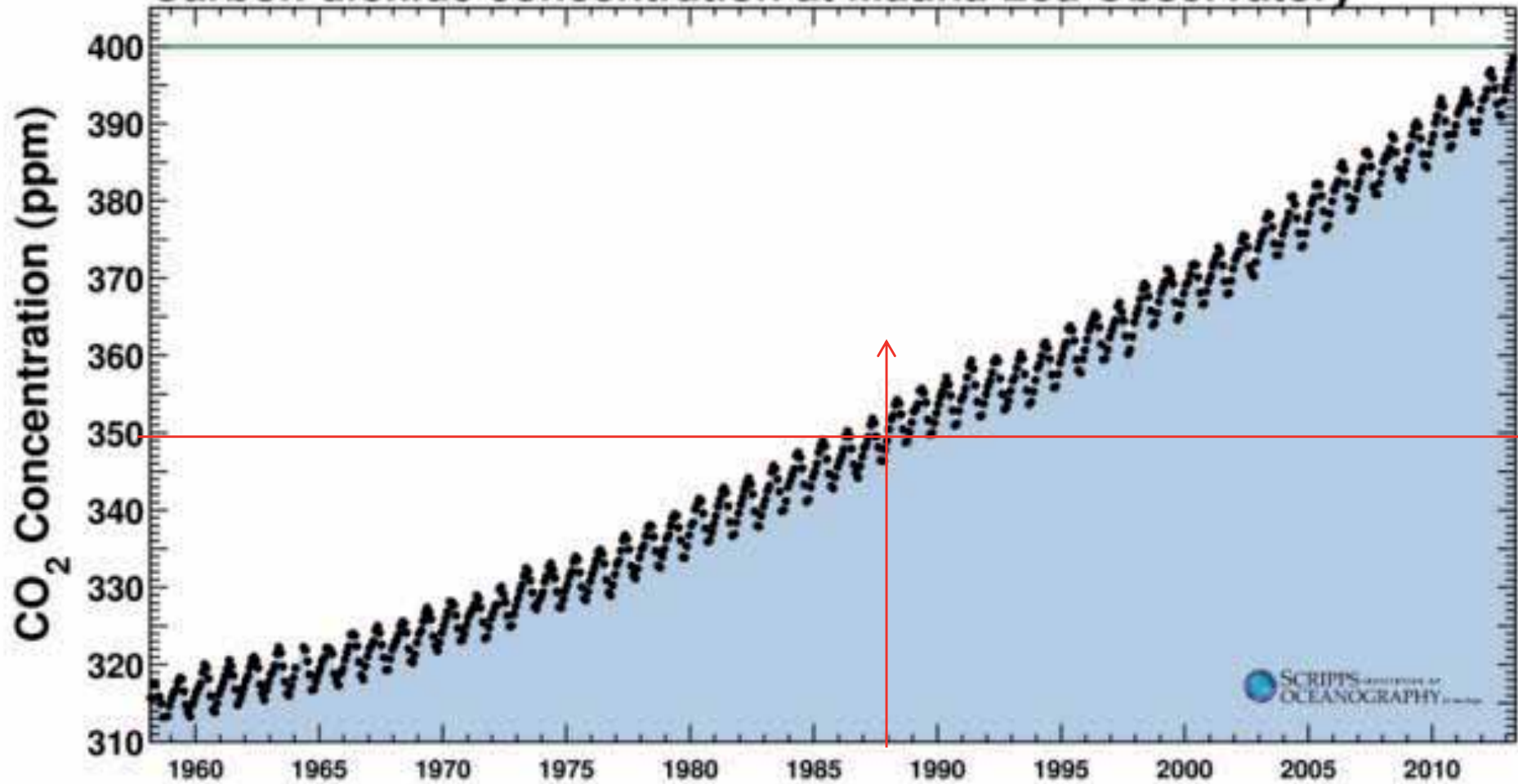# Iconos para el AR5

We are there already!

September 16, 2012

Previous record
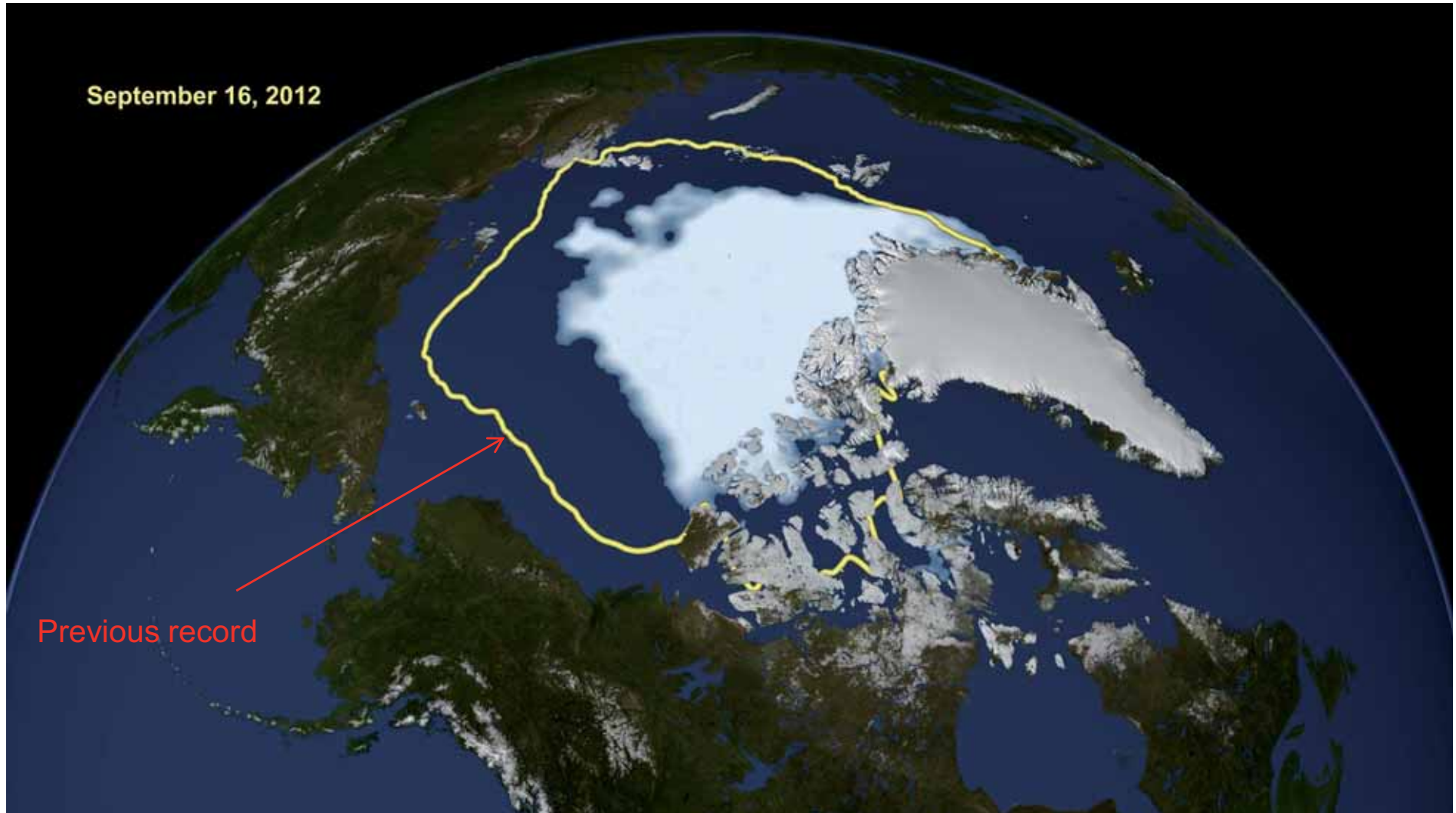
On May 7th, the 400 ppm mark was exceeded for the first time in over 3 million years

Carbon dioxide concentration at Mauna Loa Observatory

Week ending May 14, 2013

· Hourly average
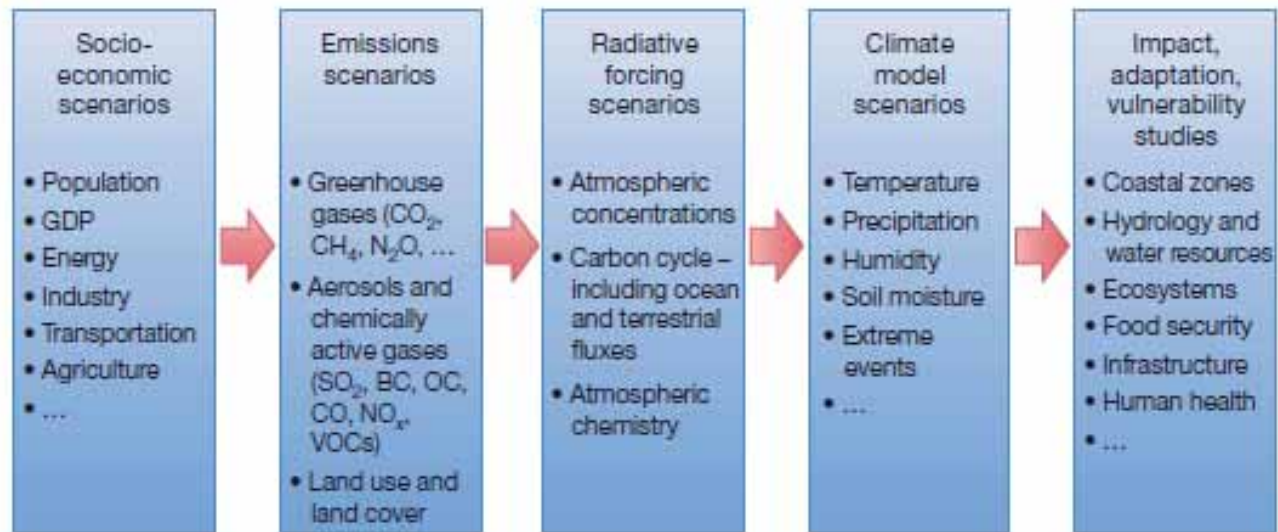● Daily average

CO$_2$ Concentration (ppm)

Mauna Loa Local Time
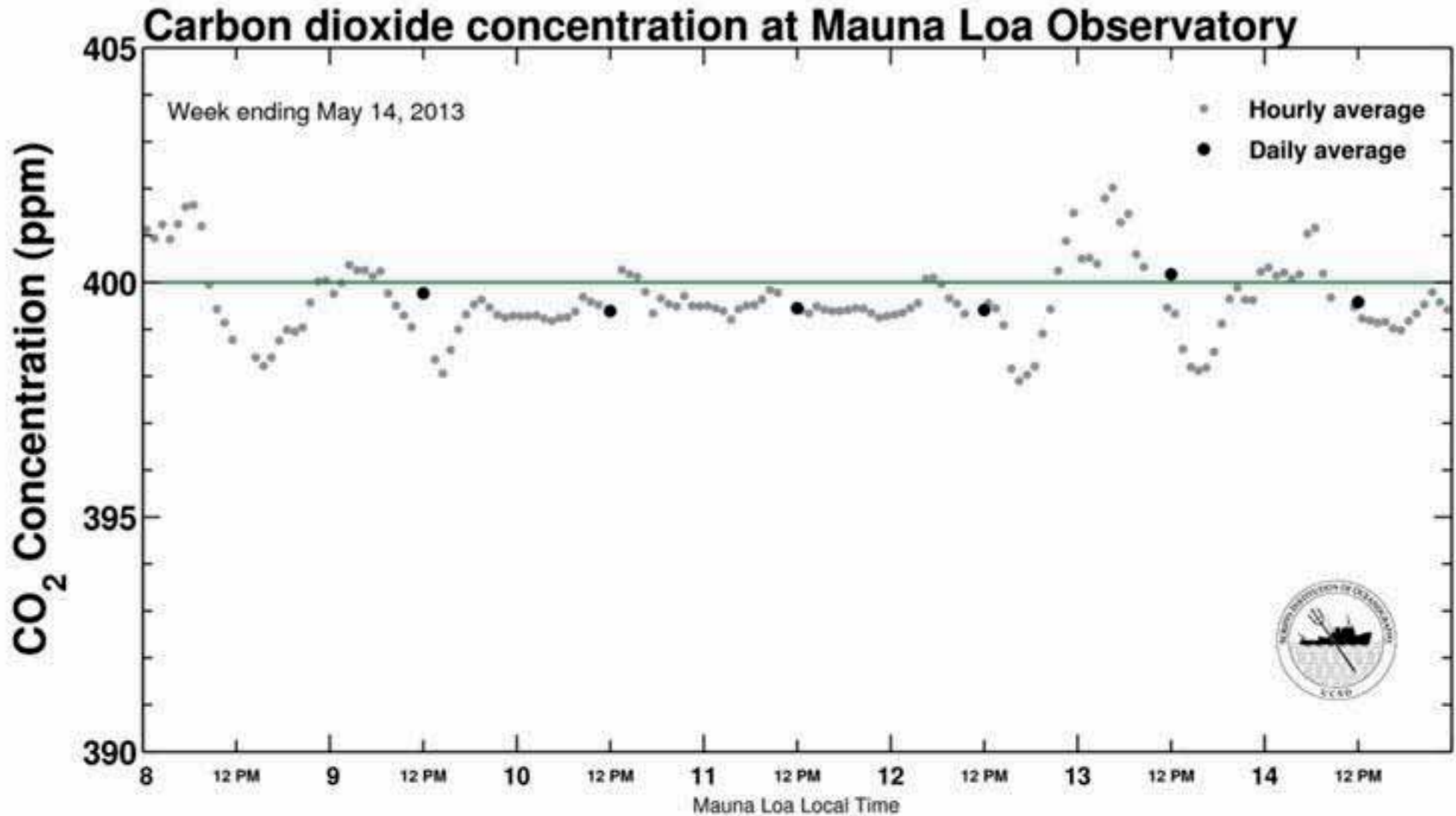
Carbon dioxide concentration at Mauna Loa Observatory

# El nuevo enfoque de la aproximación a la construcción de escenarios

The pre-AR5 approach

Figure 3 | Sequential approach. This figure depicts the simple linear chain of causes and consequences of anthropogenic climate change. Scenarios were developed on the basis of this sequence, and handed from one research community to the next in a lengthy process that led to inconsistencies. GDP, gross domestic product; BC, black carbon; OC, organic carbon; VOCs, volatile organic compounds. Figure adapted from ref. 11.
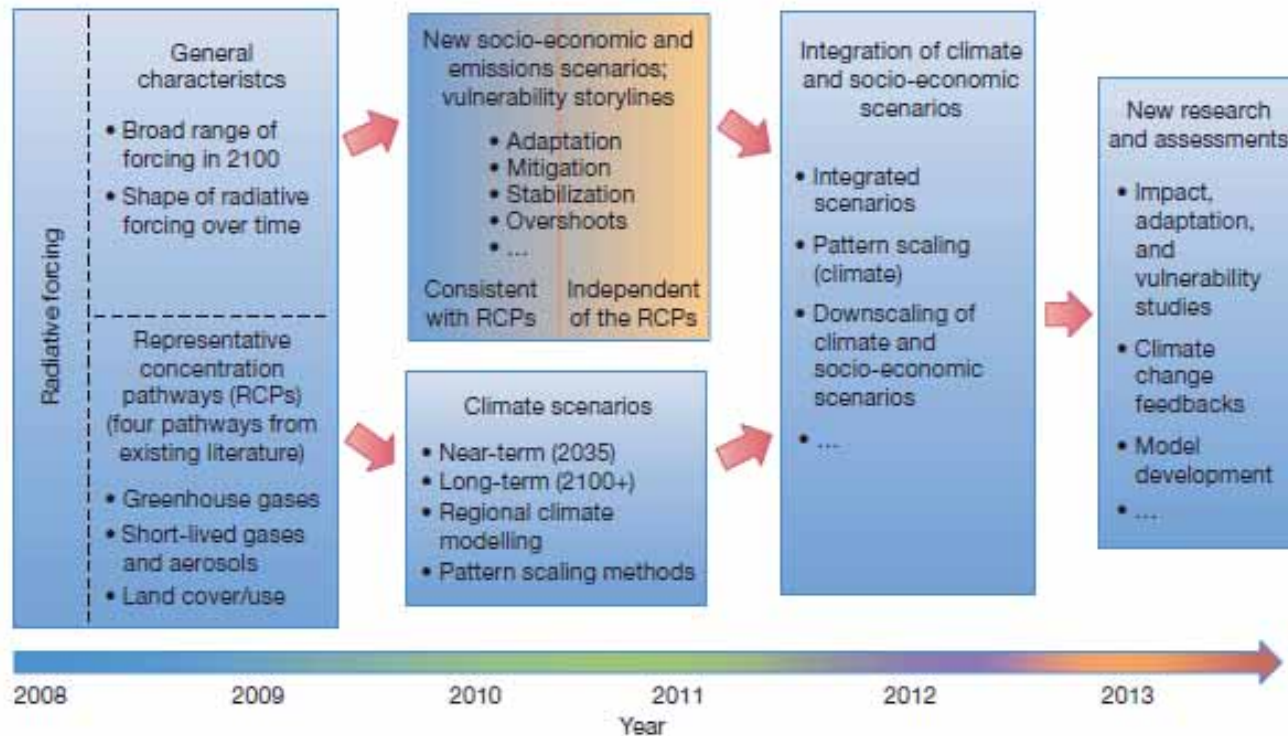
De Moss et al. 2010

Future climate
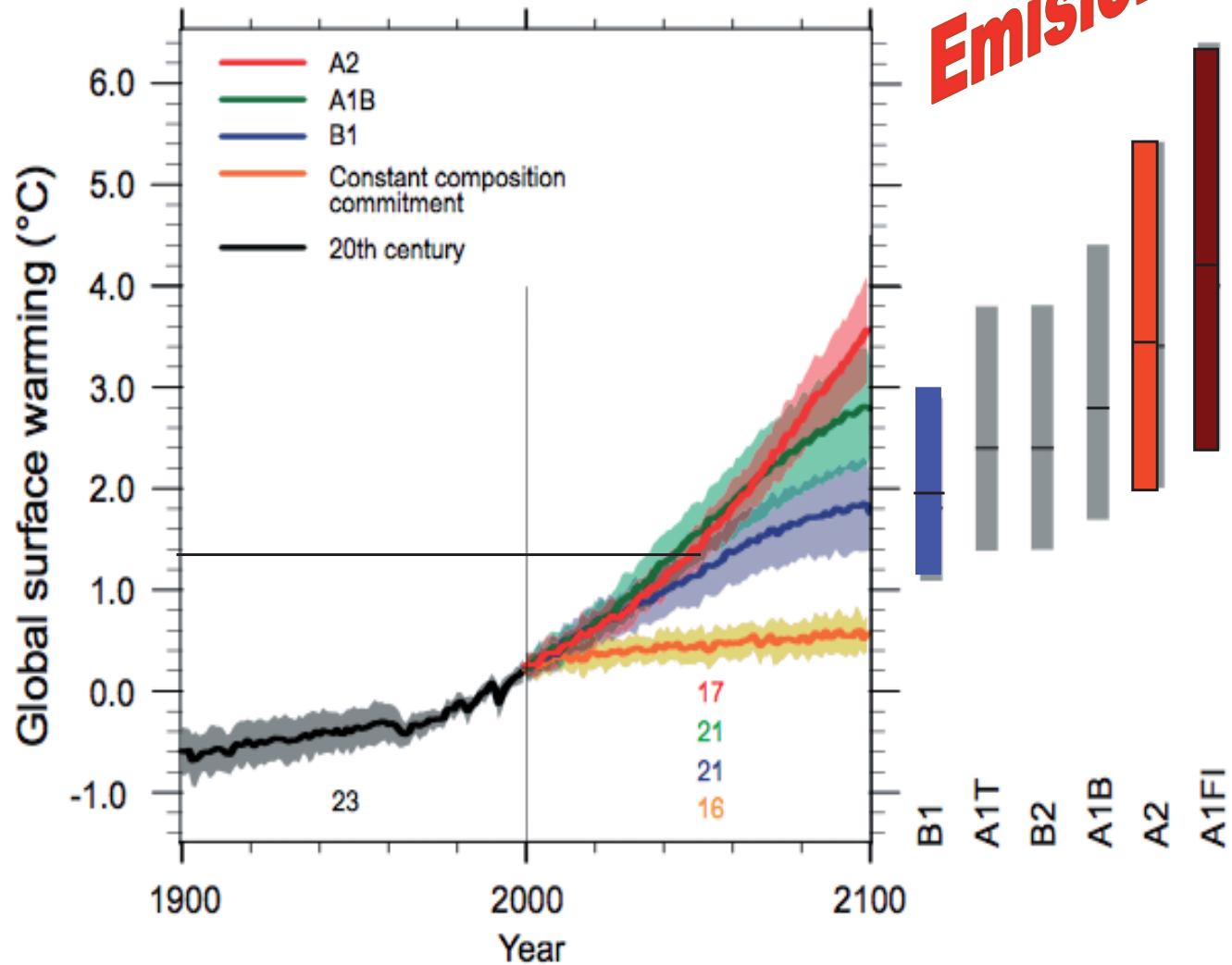
Scenario B1: Best estimate 1.8°C; Probable range 1.1°C a 2.9°C

Scenario A1FI: Best estimate 4.0°C; Probable range 2.4°C a 6.4°C.

The AR5 approach (p.p.)

Figure 4 | The parallel process. This figure depicts the process of developing new scenarios that will be used in future climate change research and impacts assessments. The process began with identification of radiative forcing characteristics that support modelling of a wide range of possible future climates. Representative concentration pathways (RCPs) were selected from the published literature to provide needed inputs of emissions, concentrations and land use/cover for climate models. In parallel with development of climate scenarios based on the RCPs, new socio-economic scenarios (some consistent with the ra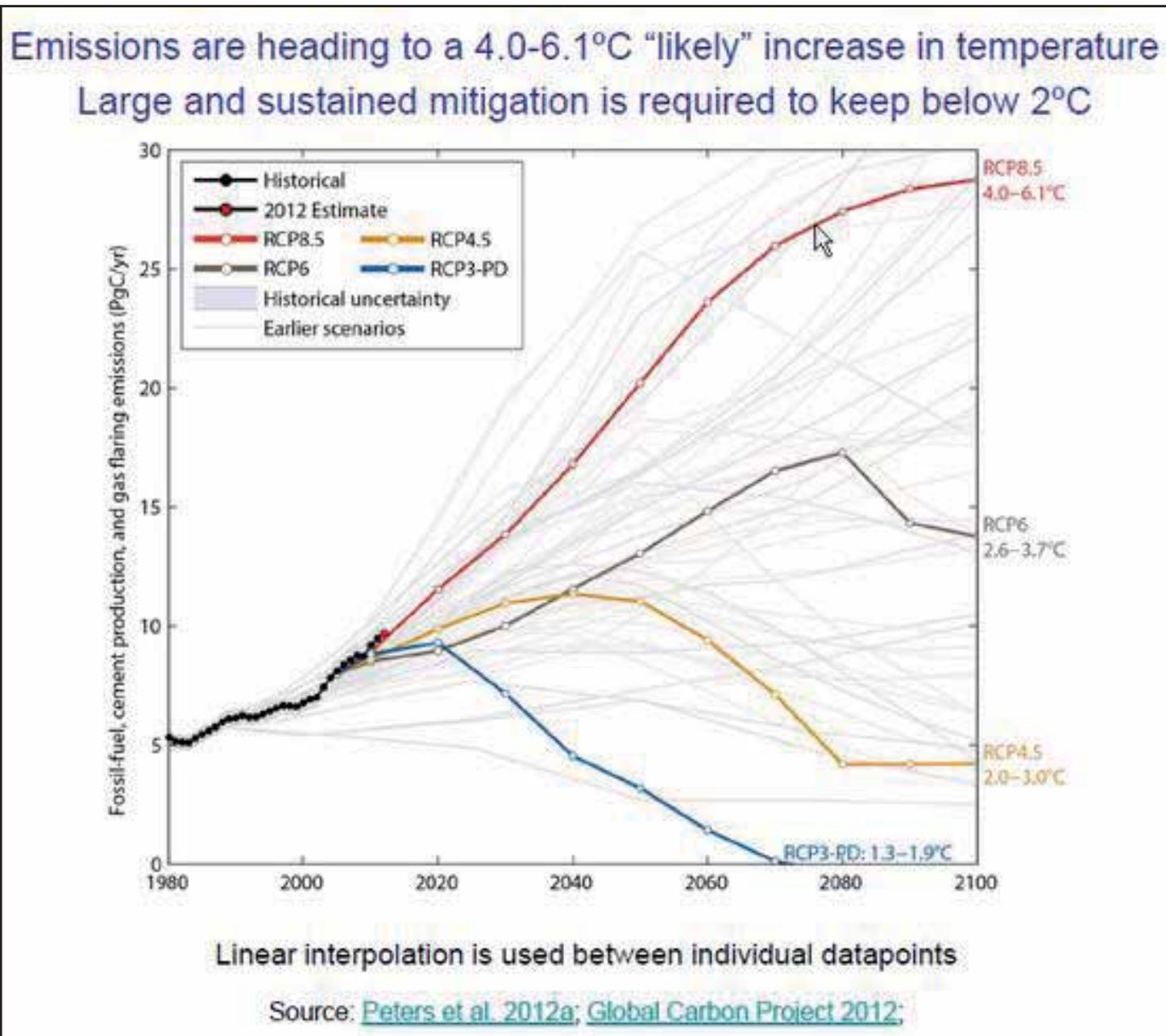diative forcing characteristics used to identify the RCPs and some developed to explore completely different futures and issues) will be developed to explore important socio-economic uncertainties affecting both adaptation and mitigation. Using a variety of tools and methods, such as pattern scaling, the new socio-economic scenarios will be integrated with the new climate scenarios. New research using the integrated scenarios will explore adaptation, mitigation and other issues such as feedbacks, using consistent assumptions. This research will provide insights into the costs, benefits and risks of different climate futures, policies and socio-economic development pathways.

De Moss et al. 2010
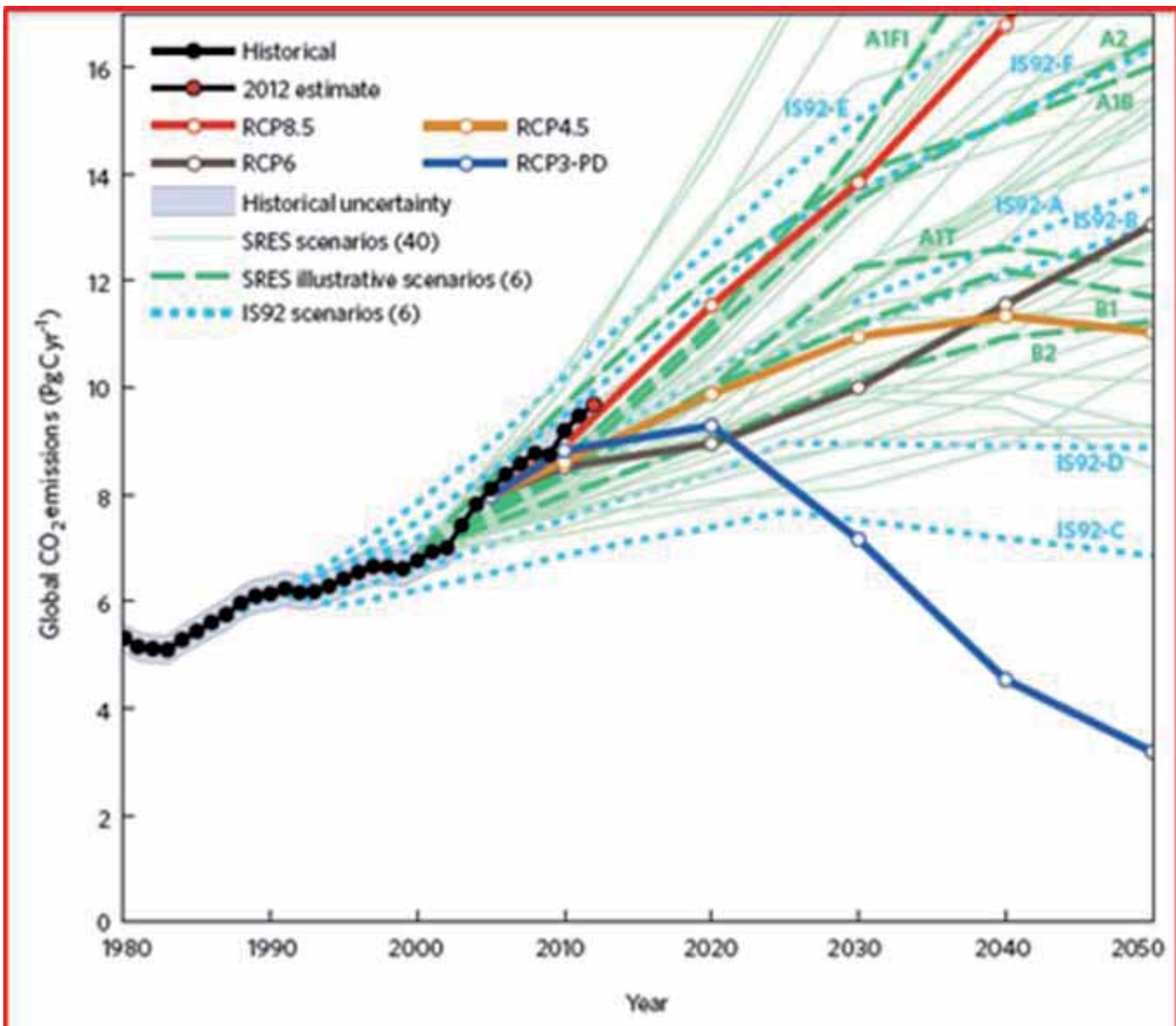
Figure 1 | Estimated CO$_2$ emissions over the past three decades compared with the IS92, SRES and the RCPs. The SA90 data are not shown, but the most relevant (SA90-A) is similar to IS92-A and IS92-F. The uncertainty in historical emissions is ±5% (one standard deviation). Scenario data is generally reported at decadal intervals and we use linear interpolation for intermediate years.

De Peters et al. 2012.

Emissions track RCP8.5

Emissions are heading to a 4.0-6.1°C "likely" increase in temperature
Large and sustained mitigation is required to keep below 2°C

Linear interpolation is used between individual datapoints

Source: Peters et al. 2012a; Global Carbon Project 2012;

Emisiones y temperatura

Simulations with many Earth system models (1, 2) show a near-linear relationship between peak warming, ΔT, and cumulative CO_2 emissions, C_∞,

$$\Delta T = \beta \cdot C_\infty \qquad (3)$$

En base a esto se puede calcular cuál será el incremento de

Temperatura para diferentes niveles acumulados de emisiones,

y determinar la futura respuesta térmica para distintos niveles

de reducción global de emisiones (Global Mitigation Schemes, GMS)

Stocker 2013 Science
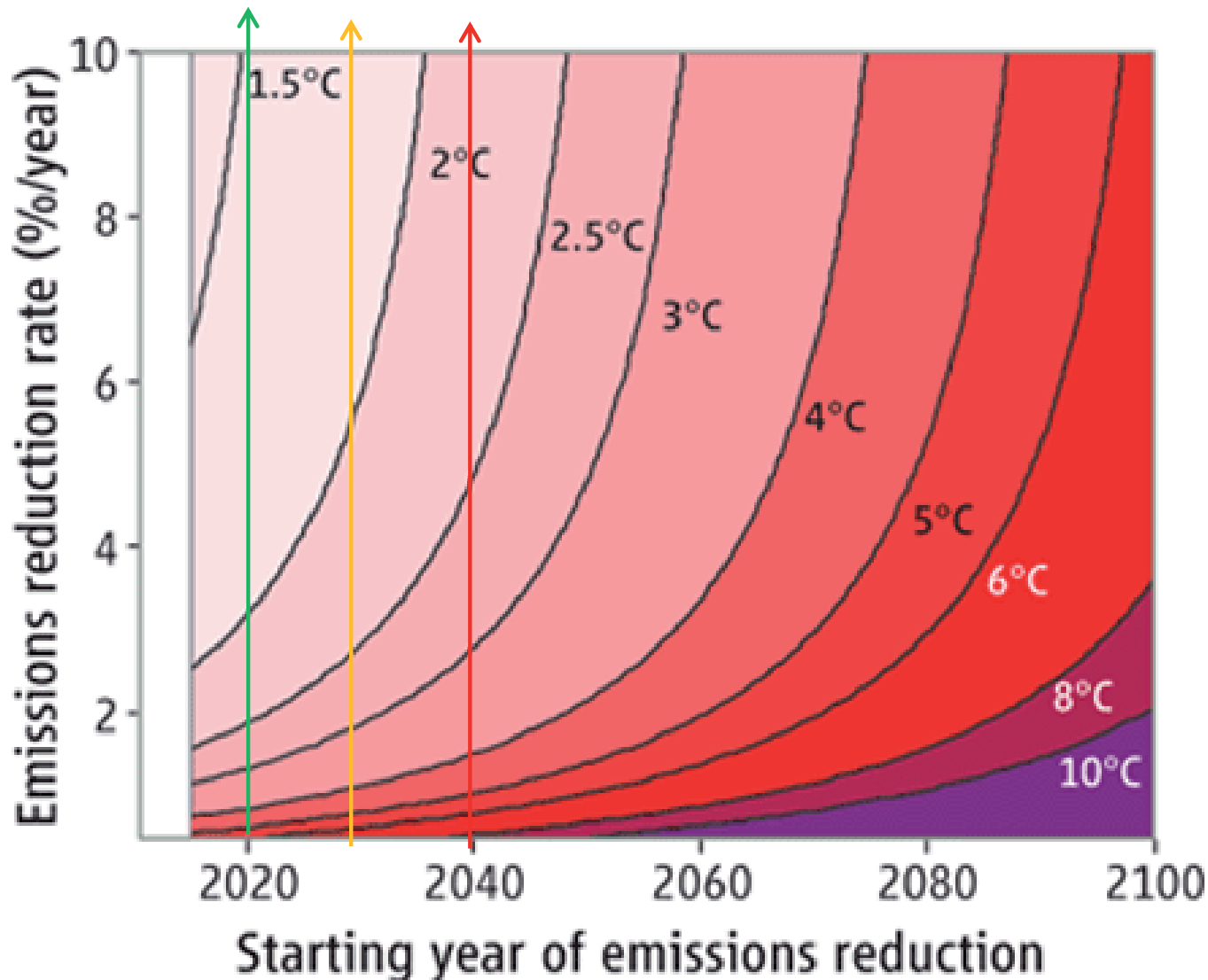
Contours of peak warming. Contours of peak CO_2-induced warming (as given by Eq. 3 in the Box) as a function of the starting date of the GMS and the implemented reduction rate of emissions. Parameters are C_0 = 530 GtC, E_0 = 9.3 GtC per year, β = 2°C $(TtC)^{-1}$, and r = 1.8% per year. The later the GMS starts, the higher the required emissions reduction rate is for a given peak warming. From Stocker 2013 Science
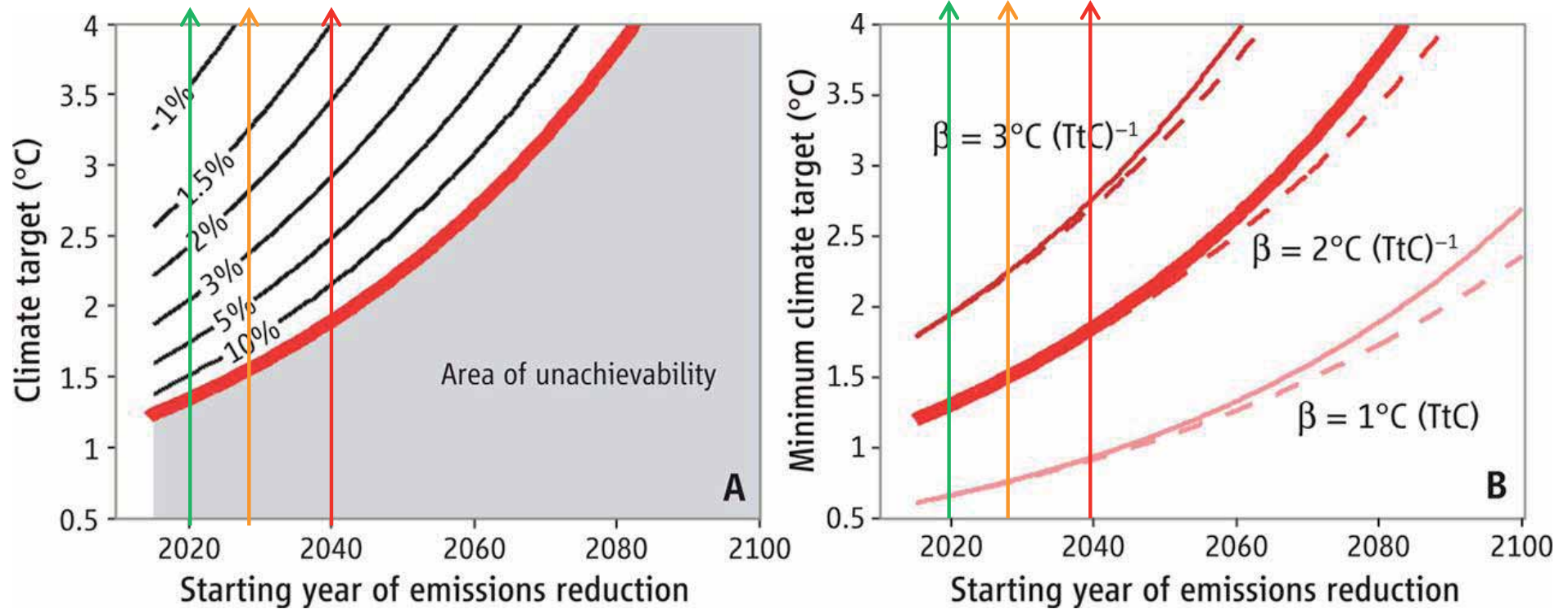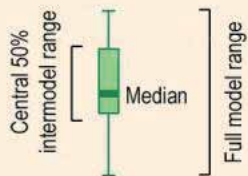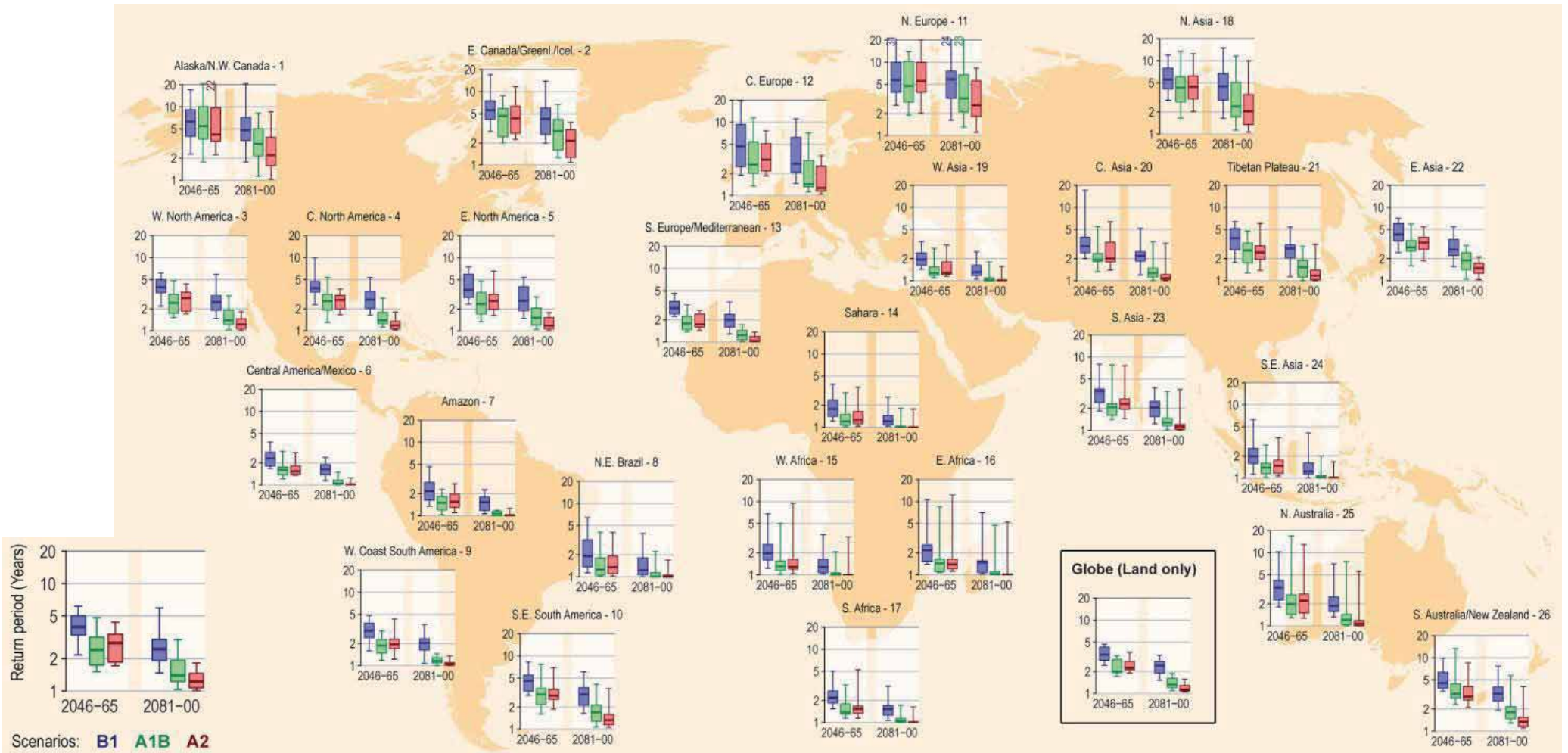
A closing door. (A) Contours of required emissions reduction rate s (% per year), derived from Eq. 3, as a function of the starting date of the GMS and the desired climate target. The red line indicates the achievable minimum climate target as a function of the starting date as given by Eq. 4. Climate targets increase exponentially with later starting years of the GMS and become unachievable in the gray shaded area. Parameters are as in the first figure.

(B) Achievable minimum climate target for three values of the peak response to cumulative emissions, β, and the rate of emissions increase used in the first figure (solid curves, $r = 1.8\%$ per year), and a lower rate of emissions increase roughly representative of the past 10 years, $r = 1.5\%$ per year (dashed curves). Higher values of β imply higher peak warming. From Stocker 2013 Science
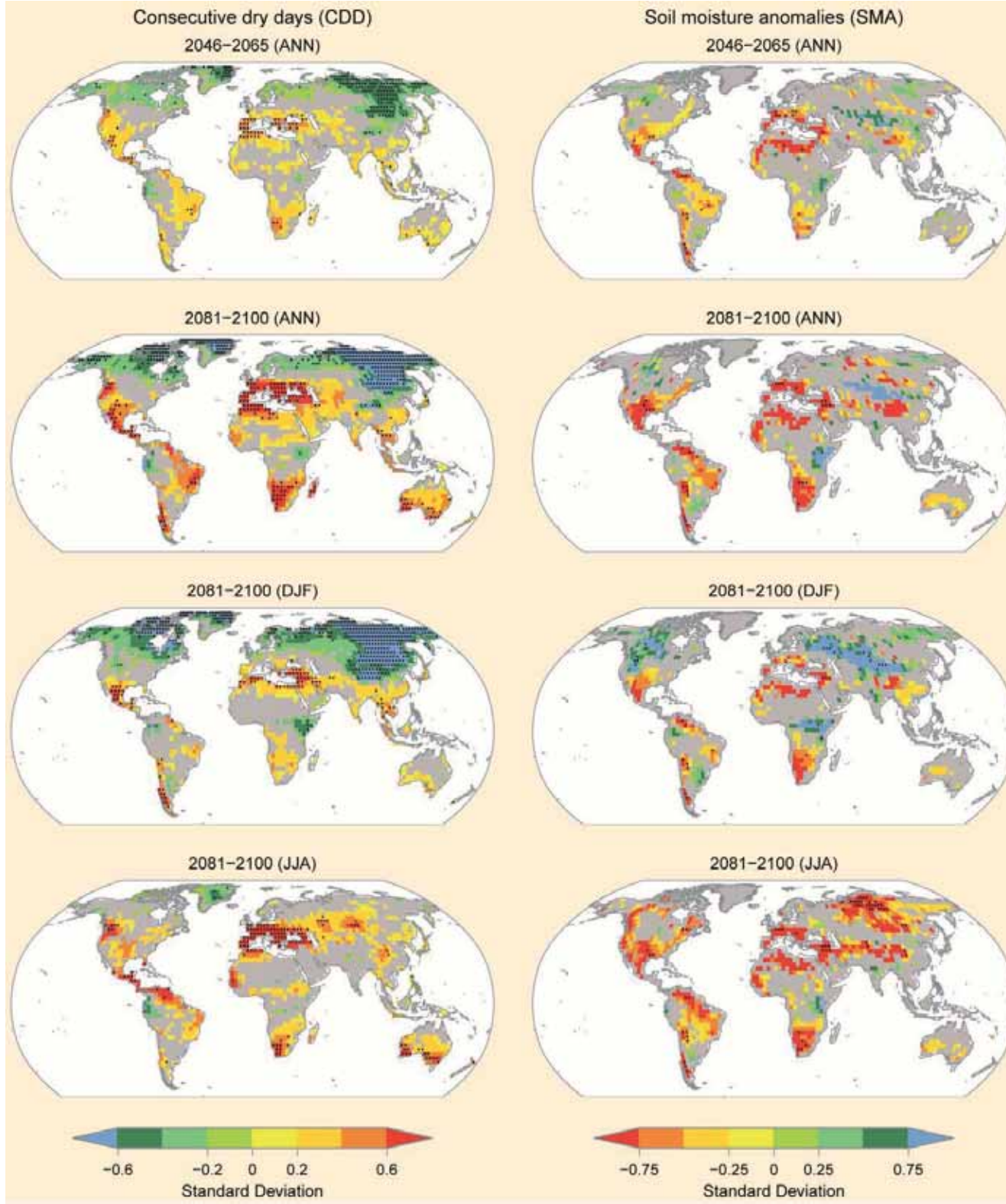
Principales determinantes

...incluido España

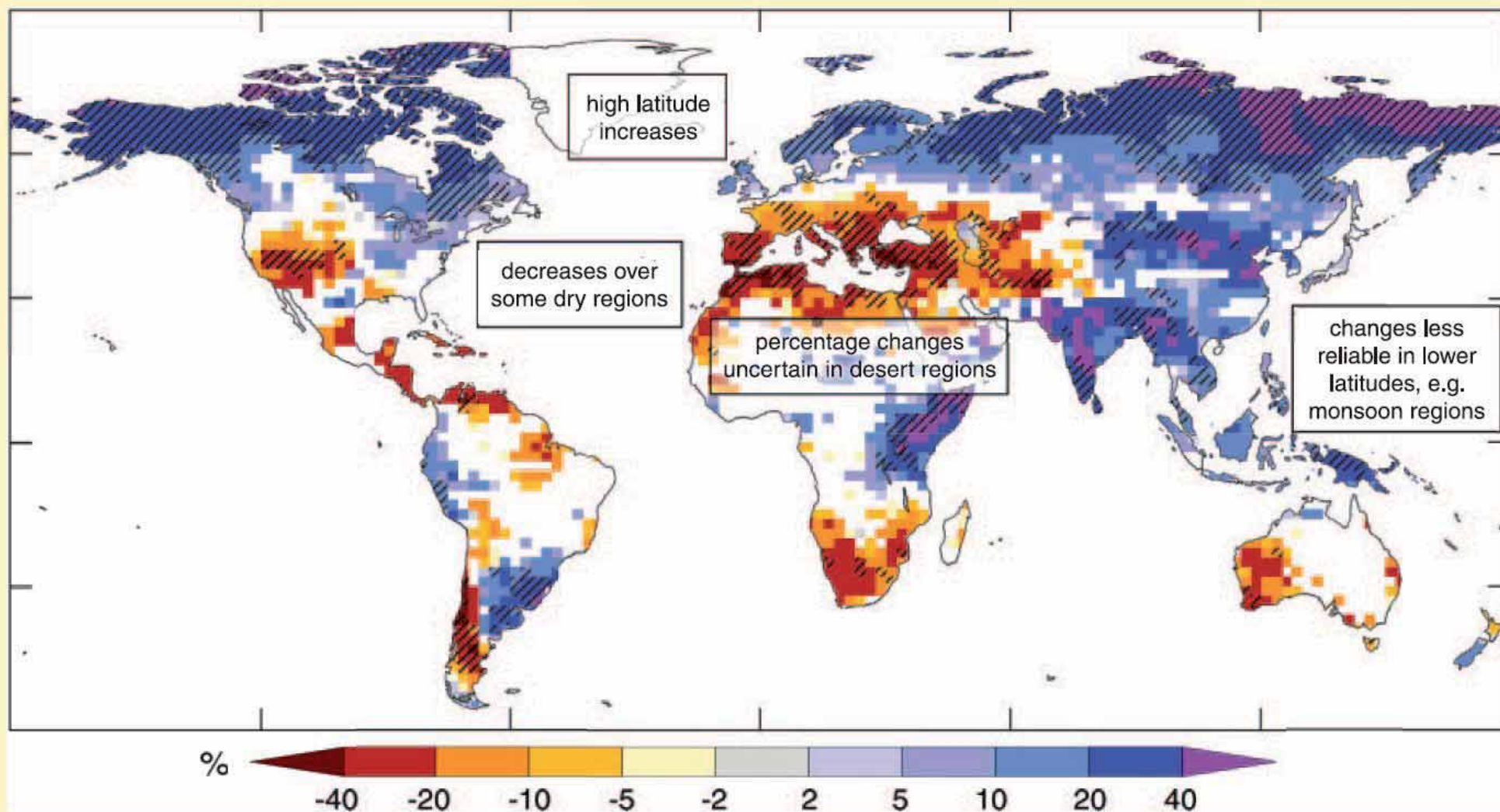# Climate change models anticipate more hot days during this century

IPCC 2011, SREX

Consecutive dry days (CDD)
2046–2065 (ANN)

Soil moisture anomalies (SMA)
2046–2065 (ANN)

More dryness

2081–2100 (ANN)

2081–2100 (ANN)

2081–2100 (DJF)

2081–2100 (DJF)

2081–2100 (JJA)

2081–2100 (JJA)

-0.6   -0.2   0   0.2   0.6
Standard Deviation

-0.75   -0.25   0   0.25   0.75
Standard Deviation

SREX 2007

Runoff by the end of the 21st century

Projections and model consistency of relative changes in runoff by the end of the 21st century

high latitude increases

decreases over some dry regions

percentage changes uncertain in desert regions

changes less reliable in lower latitudes, e.g. monsoon regions

%   -40   -20   -10   -5   -2   2   5   10   20   40

Source IPCC 2007

Calendario del AR5 WGII

- Final revisión por expertos y gobiernos
- 15-19 Jul. 2013
  - 4th LAM meeting, Bled, Slovenia
- 28 Oct- 20 Dic. 2013
  - Distribución SPM y revisión final gobiernos
- 25-29 Mar. 2014 Plenario WGII, Yokohama, Japón

¡Gracias !