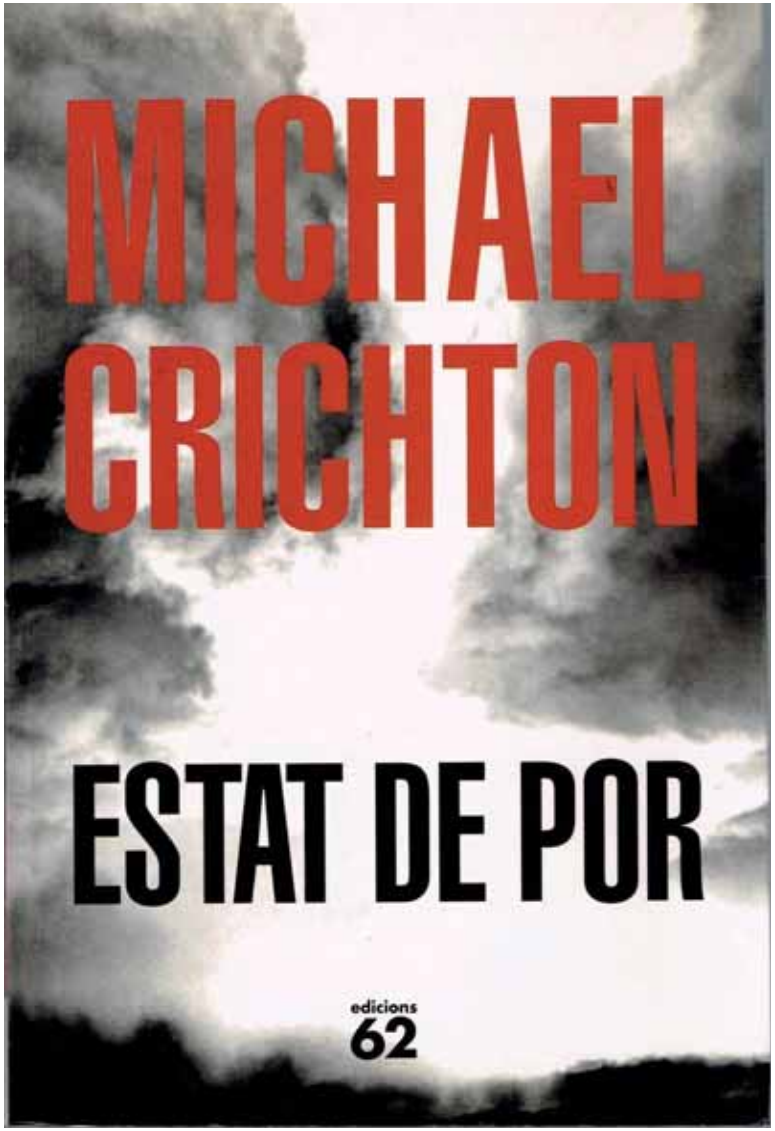
Avances en el conocimiento del CC desde el AR4

Ferran P. Vilar

X Seminario “Respuestas desde la comunicación y la educación frente al cambio climático”

Valsaín, 15/10/2013

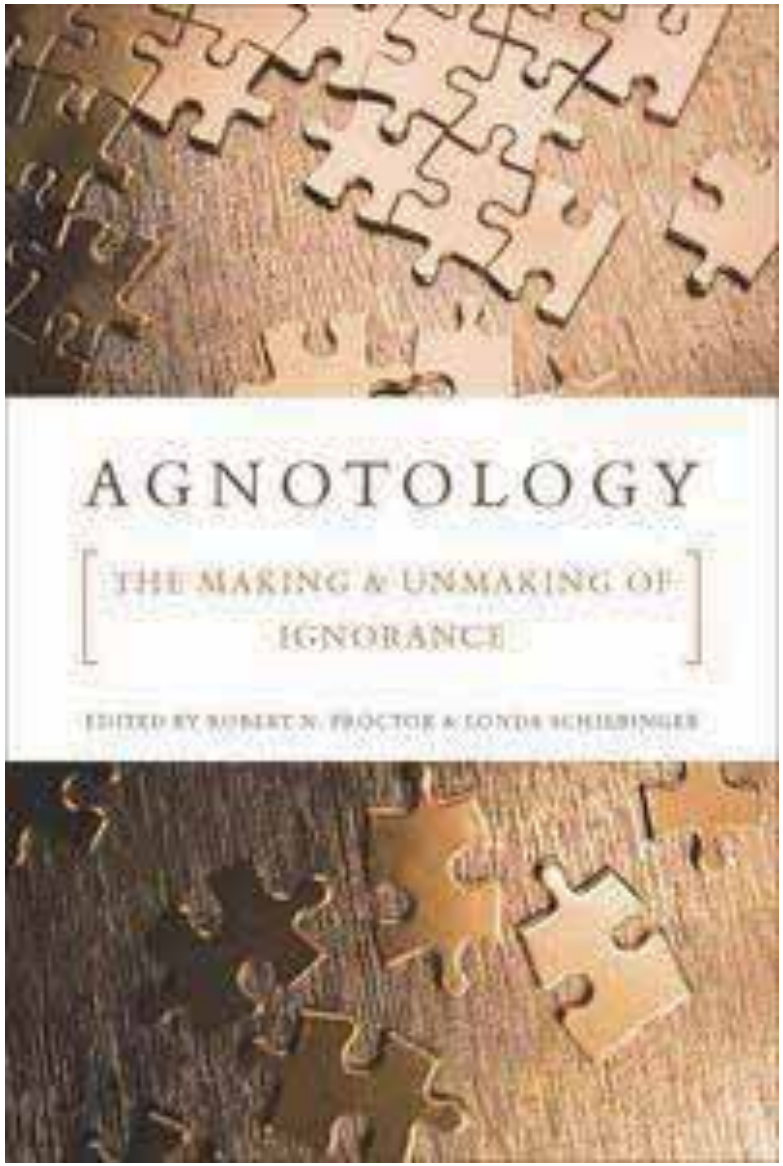

MICHAEL
CRICHTON
ESTAT DE POR
edicions
62

“No sabemos lo suficiente como para saber qué va a pasar con el cambio climático”

Daniel Cano

Presidente de Aemet

Me gustaría recomendar el uso sostenible de los recursos,
pero eso es complicado.



The study of ignorance and its cultural production

Agnotology as a Teaching Tool: Learning Climate Science by Studying Misinformation

Daniel Bedford

ABSTRACT

Despite the existence of a clear scientific consensus about global warming, opinion surveys find confusion among the American public, regarding both scientific issues and the strength of the scientific consensus. Evidence increasingly points to misinformation as a contributing factor. This situation is both a challenge and an opportunity for science educators, including geographers. The direct study of misinformation—termed agnotology (Proctor 2008)—can potentially sharpen student critical thinking skills, raise awareness of the processes of science such as peer review, and improve understanding

ril 2012

INTRODUCTION

Agnotology is a term recently coined by science historian Robert Proctor and linguist Iain Boal to refer to the study of ignorance and its cultural production (Proctor 2008). While epistemology is the study of knowledge, how and why we know things, agnotology is the study of how and why we do not know things. As such, it presents a potentially useful tool for students to explore topics where knowledge is or has been contested by different interest groups, such as evolution by natural selection versus intelligent design, or the scientific and legal struggle to identify cigarette smoke as a significant health hazard. Directly relevant for the geography classroom is the debate between global warming proponents and skeptics. This article focuses on the use of agnotology—the study of how and why ignorance or misunderstanding exists—as a teaching tool to explore the science of global warming. First, the misconceptions about global warming that opinion polls have found among the general public (and, by extension, among students) are outlined. Second, the role of misleading or inaccurate statements in the popular media (referred to in this article as "misinformation") in creating this

"The goal of incorporating agnotology as a teaching tool in the classroom is to study how and why there is ignorance about well-established facts about global warming, such as why public opinion sees disagreement among scientists when little or none exists. This can be approached through the explicit study of influential works of agnogenesis, including op-ed articles by syndicated columnists, and the best-selling novel State of Fear, by Michael Crichton (2004), which includes many of the more commonly encountered arguments from the wider agnogenesis literature. "

Daniel Bedford (2011) - Agnotology as a Teaching Tool: Learning Climate Science by Studying Misinformation - Journal of Geography 109:159-165 doi:10.1080/00221341.2010.498121 - Geography Department, Weber State University

Sci & Educ (2013) 22:2007–2017
DOI 10.1007/s11191-013-9588-3

Learning and Teaching Climate Science: The Perils of Consensus Knowledge Using Agnotology

David R. Legates · Willie Soon · William M. Briggs

Fact recitation coupled with demonizing any position or person who disagrees with a singularly-derived conclusion has no place in education. Instead, all sides must be covered in highly debatable and important topics such as climate change, because authoritarian science never will have all the answers to such complex problems."

David R. Legates, Willie Soon and William M. Briggs (2013) - Learning and Teaching Climate Science: The Perils of Consensus Knowledge Using Agnotology - Science and Education 22:2007–2017
doi:10.1007/s11191-013-9588-3 - Department of Geography, University of Delaware; Harvard-Smithsonian Center for Astrophysics

nature climate change

PERSPECTIVE

PUBLISHED ONLINE: 14 JULY 2013 | DOI: 10.1038/NCLIMATE1844

Promoting interdisciplinarity through climate change education

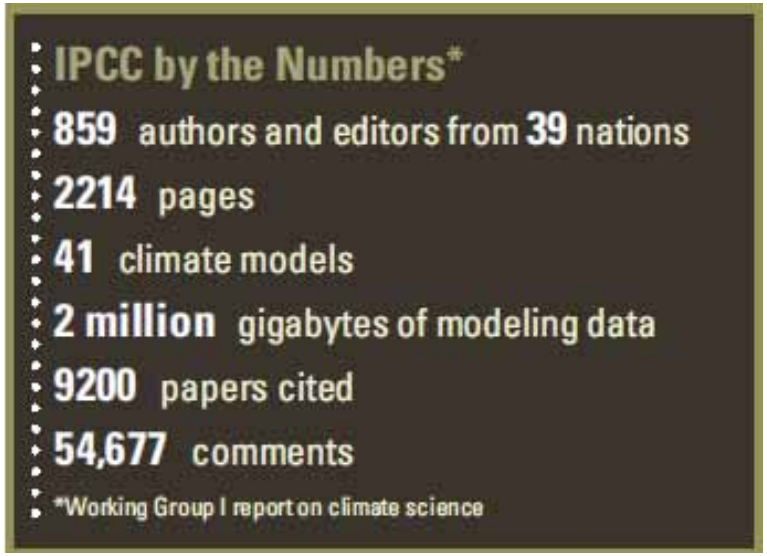
Aaron M. McCright[1,2*], Brian W. O'Shea[1,3], Ryan D. Sweeder[1], Gerald R. Urquhart[1,4] and Aklilu Zeleke[1,5]

Climate change is a complex scientific and social problem. Effectively dealing with it presents an immense challenge, yet educating students about it offers educators in science, technology, engineering and mathematics (STEM) fruitful opportunities for promoting interdisciplinarity, retaining talented young people in STEM fields and enhancing multiple literacies of all students. We offer three illustrative examples of interdisciplinary climate change-related STEM education projects. Each of these models is designed deliberately for implementation in the first two years of collegiate-level STEM courses; thus, they may be employed in both four- and two-year institutions. The scientific community can use climate change education opportunities to help further transform STEM education in the US and increase production of high-quality STEM graduates.

We offer three illustrative examples of interdisciplinary climate change-related STEM education projects. Each of these models is designed deliberately for implementation in the first two years of collegiate-level STEM courses; thus, they may be employed in both four- and two-year institutions. The scientific community can use climate change education opportunities to help further transform STEM education in the US and increase production of high-quality STEM graduates."

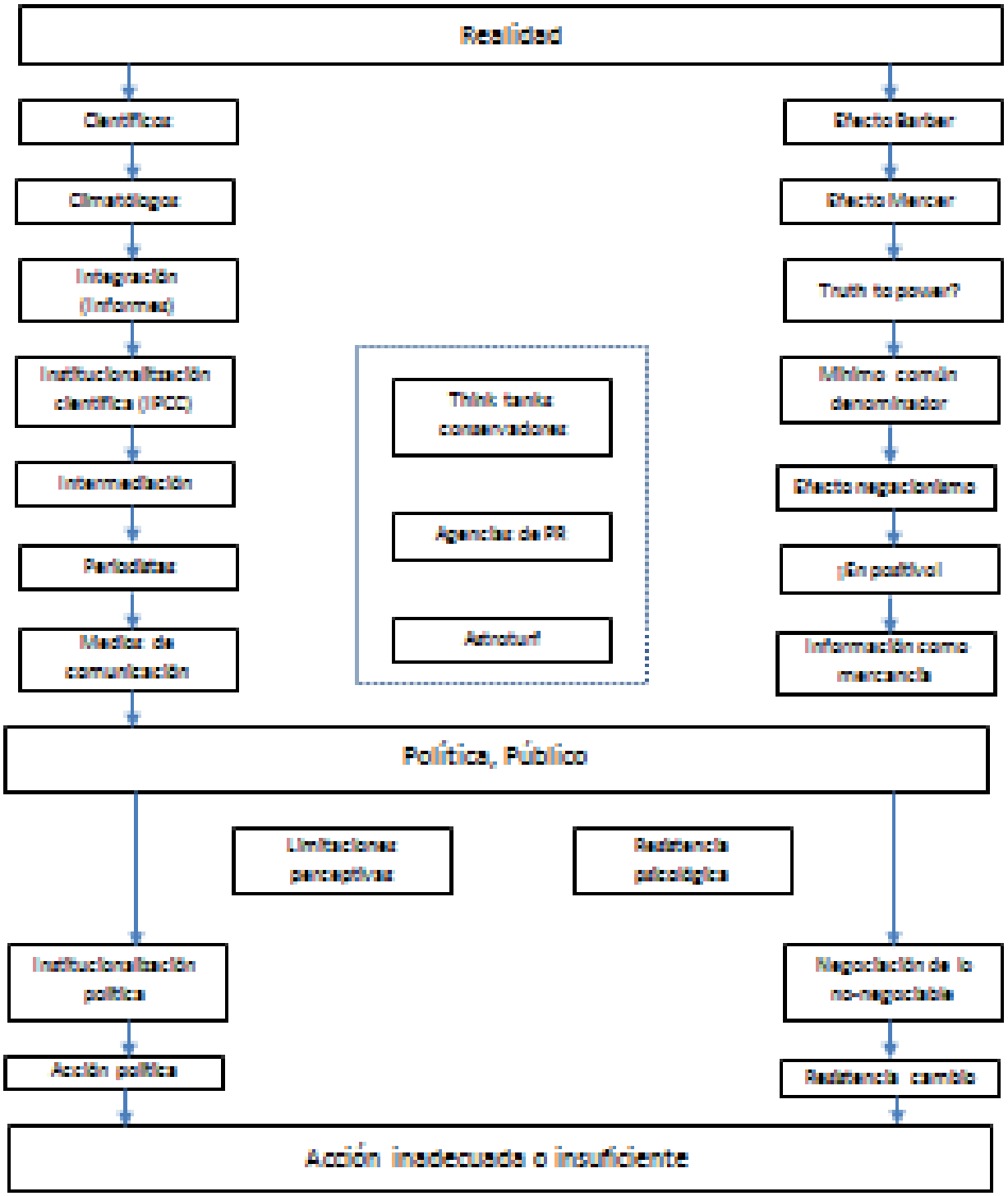
Aaron M. McCright et al (2013) - Promoting interdisciplinarity through climate change education - Nature Climate Change 3:713–716 doi:10.1038/nclimate1844 - Published online: 14/07/2013 - Department of Sociology and Environmental Science and Policy Program + Lyman Briggs College, Michigan State University - https://www.msu.edu/~urquhart/professional/Nature-Climate-Change-McCright-2013.pdf

IPCC WGI 2013 - Novedades



No novedad:
Peor que el anterior

- Escenarios
- Lenguaje de incertidumbre
- Variables
  - Nivel del mar
  - Hielo Ártico
  - Forzamiento neg. aerosoles
- TCR, ESS
- Ciclo del agua
- Atribución variabilidad natural
- Geoingeniería
- Comunicación
  - 19 declaraciones
  - Viernes mañana
  - Movimiento browniano


Realidad
Científicos
Climatólogos
Integración (Informes)
Institucionalización científica (IPCC)
Intermediación
Periodistas
Medios de comunicación
Think tanks conservadores
Agencias de PR
Astroturf
Efecto Barber
Efecto Mercer
Truth to power?
Mínimo común denominador
Efecto negacionismo
¡Sin positivo!
Información como mercancía
Política, Público
Limitaciones perceptivas
Resistencia psicológica
Institucionalización política
Acción política
Negociación de lo no-negociable
Resistencia cambio
Acción inadecuada o insuficiente

Resistance by Scientists to Scientific Discovery

This source of resistance has yet to be given the scrutiny accorded religious and ideological sources.

Bernard Barber

In the study of the history and sociology of science, there has been a relative lack of attention to one of the interesting aspects of the social process of discovery—the resistance on the part of scientists themselves to

themselves sometimes resist scientific discovery clashes, of course, with the sterotype of the scientist as "the open-minded man." The norm of open-mindedness is one of the strongest of the scientist's values. As Philipp

Helmholtz, Planck, and Lister

Although the resistance by scientists themselves to scientific discovery has been neglected in systematic analysis, it would be surprising indeed if it had never been noted at all. If nowhere else, we should find it in the writings of those scientists who have suffered from resistance on the part of other scientists. Helmholtz, for example, made aware of such resistance by his own experience, commiserated with Faraday on "the fact that the greatest benefactors of mankind usually do not obtain a full reward during their life-time, and that new ideas need the more time for gaining general assent the more really original they are" (*7–9*). Max Planck is another who noticed resistance in general because he had experienced it himself, in regard to some new ideas on the second law of thermodynamics which he worked out in his

"When Arrhenius published his theory of electrolytic dissociation, his ideas met with resistance for a time, though eventually, thanks in part to Ostwald, the theory was accepted and Arrhenius was given the Nobel prize for it."

Bernard Barber (1961) - Resistance by Scientists to Scientific Discovery - Science 134:596-602 doi:10.1126/science.134.3479.596 - Director of the Centre for the Study of Knowledge Expertise Science at Cardiff University

La ‘reticencia’ científica

James E. Hansen

“I believe there is a pressure on scientists to be conservative. Papers are accepted for publication more readily if they do not push too far and are larded with caveats … I could not see how to prove the existence of a ‘scientific reticence’ about ice sheets and sea level.

James Hansen (2007) - Scientific reticence and sea level rise - Environmental Research Letters 2 024002 doi:10.1088/1748-9326/2/2/024002 -

Ross Garnaut

"My own experience and observations of related phenomena suggest that the source of bias is scholarly reticence. It is not optimism that is unscholarly, but being too far away from the mainstream. That could potentially cut either way on climate change. However ... There must be a possibility that has led to understatement of the risks.“

Ross Garnaut (2011) - Garnaut Climate Change Review - Update 2011: Update Paper 5: The science of climate change - Australian Government - -

Carga electrón Millikan

G Model
JGEC-1043; No. of Pages 11

ARTICLE IN PRESS

Global Environmental Change xxx (2012) xxx–xxx

Contents lists available at SciVerse ScienceDirect

Global Environmental Change

journal homepage: www.elsevier.com/locate/gloenvcha

Climate change prediction: Erring on the side of least drama?

Keynyn Brysse [a,*], Naomi Oreskes [b], Jessica O'Reilly [c], Michael Oppenheimer [d]

[a] Program in Science, Technology and Society, Office of Interdisciplinary Studies, University of Alberta, Canada
[b] History and Science Studies, University of California, San Diego, United States
[c] Department of Sociology, College of St. Benedict/St. John's University, United States
[d] Department of Geosciences and Woodrow Wilson School of Public and International Affairs, Princeton University, United States

ARTICLE INFO

Article history:
Received 21 December 2011

ABSTRACT

Over the past two decades, skeptics of the reality and significance of anthropogenic climate change have frequently accused climate scientists of "alarmism": of over-interpreting or overreacting to evidence of

"The available evidence suggests that scientists have in fact been conservative in their projections of the impacts of climate change. In particular, we discuss recent studies showing that at least some of the key attributes of global warming from increased atmospheric greenhouse gases have been under-predicted, particularly in IPCC assessments of the physical science, by Working Group I. We also note the less frequent manifestation of over-prediction of key characteristics of climate in such assessments.

Keynyn Brysse et al (2013) - Climate change prediction: Erring on the side of least drama? - Global Environmental Change 23:327–337 doi:10.1016/j.gloenvcha.2012.10.008 - Program in Science, Technology and Society, Office of Interdisciplinary Studies, University of Alberta

Climatic Change (2013) 116:427–436
DOI 10.1007/s10584-012-0620-4

LETTER

Do probabilistic expert elicitations capture scientists' uncertainty about climate change?

Antony Millner · Raphael Calel · David A. Stainforth · George MacKerron

Received: 17 July 2012 / Accepted: 16 October 2012 / Published online: 3 November 2012

"We expect these results to hold to a greater extent for less understood climate variables, calling into question the veracity of previous elicitations for these quantities. Our experimental design provides an instrument for detecting ambiguity, a valuable new source of information when linking climate science and climate policy which can help policy makers select decision tools appropriate to our true state of knowledge. "

S|S|S

ABSTRACT This paper adds a new dimension to the role of scientific knowledge in policy by emphasizing the multivalent character of scientific consensus. We show how the maintained consensus about the quantitative estimate of a central scientific concept in the anthropogenic climate-change field – namely, climate sensitivity – operates as an 'anchoring device' in 'science for policy'. In international assessments of the climate issue, the consensus-estimate of 1.5°C to 4.5°C for climate sensitivity has remained unchanged for two decades. Nevertheless, during these years climate scientific knowledge and analysis have changed dramatically. We identify several ways in which the scientists achieved flexibility in maintaining the same numbers for climate sensitivity while accommodating changing scientific ideas.

We propose that the remarkable quantitative stability of the climate sensitivity range has helped to hold together a variety of different social worlds relating to climate change, by continually translating and adapting the meaning of the 'stable' range. But this emergent stability also reflects an implicit social contract among the various scientists and policy specialists involved, which allows 'the same' concept to accommodate tacitly different local meanings. Thus the very multidimensionality of such scientific concepts is part of their technical imprecision (which is more than just analytical lack of resolution); it is also the source of their resilience and value in bridging (and perhaps reorganizing) the differentiated social worlds typical of modern policy issues. The varying importance of particular dimensions of knowledge for different social groups may allow cohesion to be sustained amidst pluralism, and universality to coexist with cultural distinctiveness.

Anchoring Devices in Science for Policy:

The Case of Consensus around Climate Sensitivity

Jeroen van der Sluijs, Josée van Eijndhoven, Simon Shackley and Brian Wynne

Experts started drafting assessment reports for policy-makers when research on anthropogenic climate change (and especially climate modelling) was still in an early stage of development. 'Assessment' is the analysis and review of information derived from research in order to help someone in a position of responsibility to evaluate possible actions, or to think about a problem. It does not usually entail doing new research. Assessment means assembling, summarizing, organizing, interpreting, and possibly reconciling pieces of existing knowledge, and communicating them so that they

Social Studies of Science 28/2(April 1998) 291–323

[0306-3127(199804)28:2;291–323;005326]

“This paper adds a new dimension to the role of scientific knowledge in policy by emphasizing the multivalent character of scientific consensus. We show how the maintained consensus about … climate sensitivity operates as an `anchoring device' in `science for policy'. In international assessments of the climate issue, the consensus-estimate of 1.5°C to 4.5°C for climate sensitivity has remained unchanged for two decades. Nevertheless, during these years climate scientific knowledge and analysis have changed dramatically. We identify several ways in which the scientists achieved flexibility in maintaining the same numbers for climate sensitivity while accommodating changing scientific ideas.”

Global Environmental Change 20 (2010) 483–491

Contents lists available at ScienceDirect

Global Environmental Change

journal homepage: www.elsevier.com/locate/gloenvcha

UNU monitor

Global warming estimates, media expectations, and the asymmetry of scientific challenge☆

William R. Freudenburg*, Violetta Muselli

Environmental Studies Program, University of California, Santa Barbara (UCSB), Santa Barbara, CA 93106-4160, USA

ARTICLE INFO

Article history:
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Received in revised form 10 March 2010
Accepted 1 April 2010

ABSTRACT

Mass media in the U.S. continue to suggest that scientific consensus estimates of global climate disruption, such as those from the Intergovernmental Panel on Climate Change (IPCC), are "exaggerated" and overly pessimistic. By contrast, work on the Asymmetry of Scientific Challenge (ASC) suggests that such consensus assessments are likely to *understate* climate disruptions. This paper offers an initial test

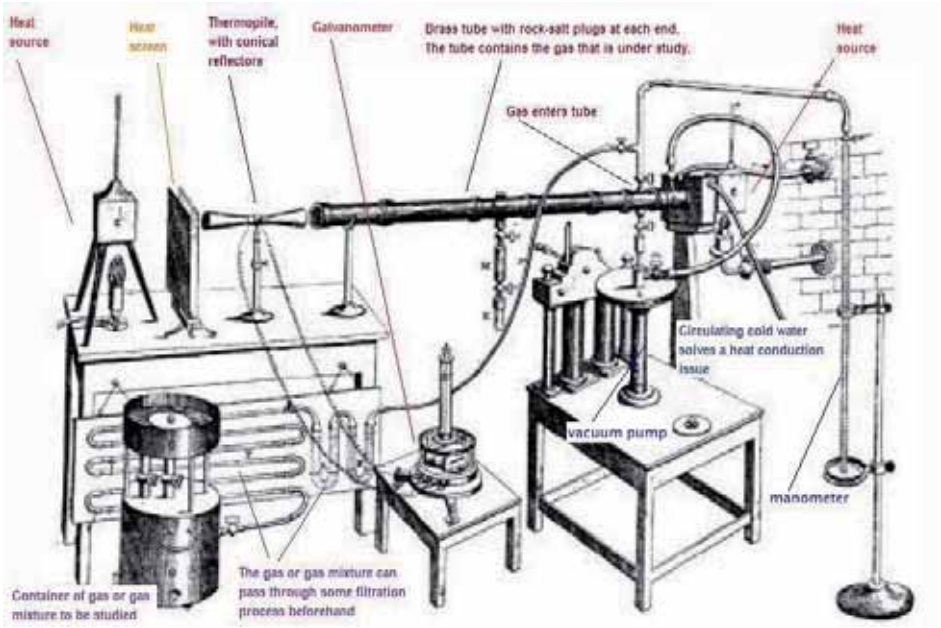
The ASC expectation, more specifically, is that the scientific outcome is likely to be precisely the opposite of the one that is most often feared — in the case of global climate disruptions, a bias toward underestimating rather than overestimating likely climate disruptions — precisely because so much of the prevailing pattern of scientific challenge has had the opposite focus and concern. ”

William R. Freudenburg and Violetta Muselli (2010) - Global warming estimates, media expectations, and the asymmetry of scientific challenge - Global Environmental Change 3:483-491
doi:10.1016/j.gloenvcha.2010.04.003 - Environmental Studies Program, University of California, Santa Barbara (UCSB)

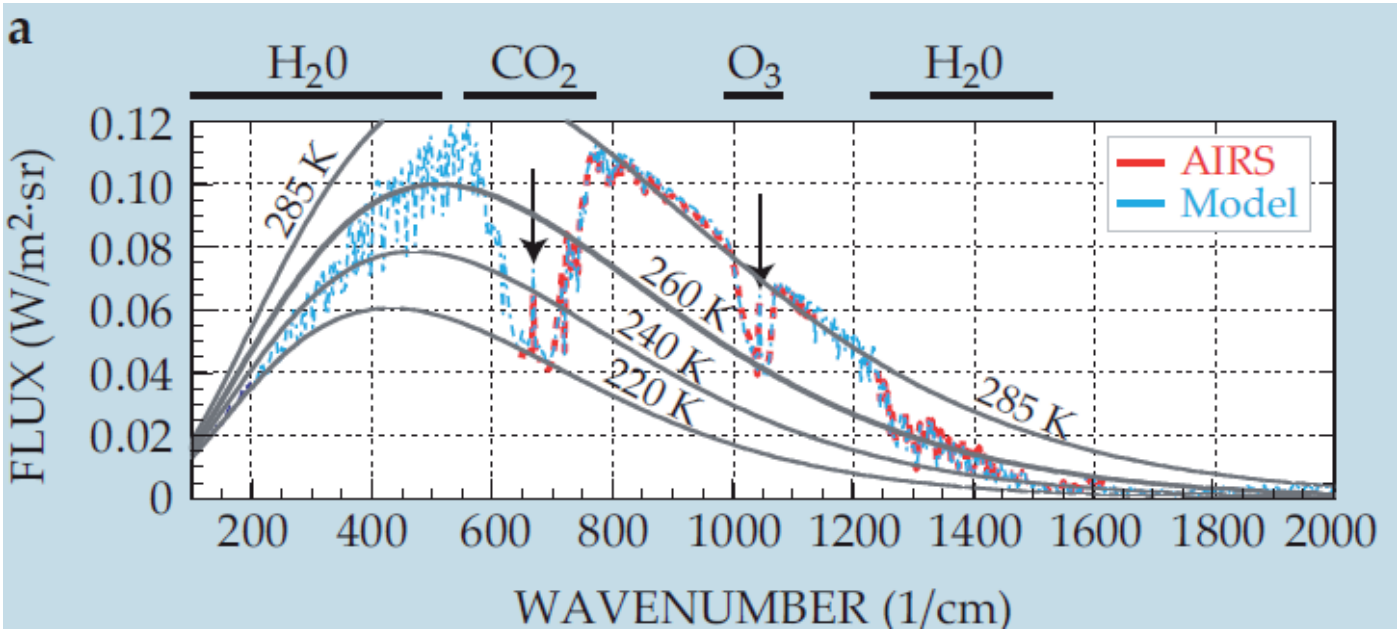
¿ASC?

- Sólo modelos
- Lazos perdidos
- Pausa?
  - Año de comparación
- Poco Tipping Points
- ECS vs. nivel del mar
- Cambio de referencia
  - 1986-2005

- Adiós
  - Anomalía térmica medieval
  - Rayos cósmicos
- Corriente termohalina
- Nivel del mar
- CC comprometido >2100
- TP Groenlandia
- Atribución reforzada

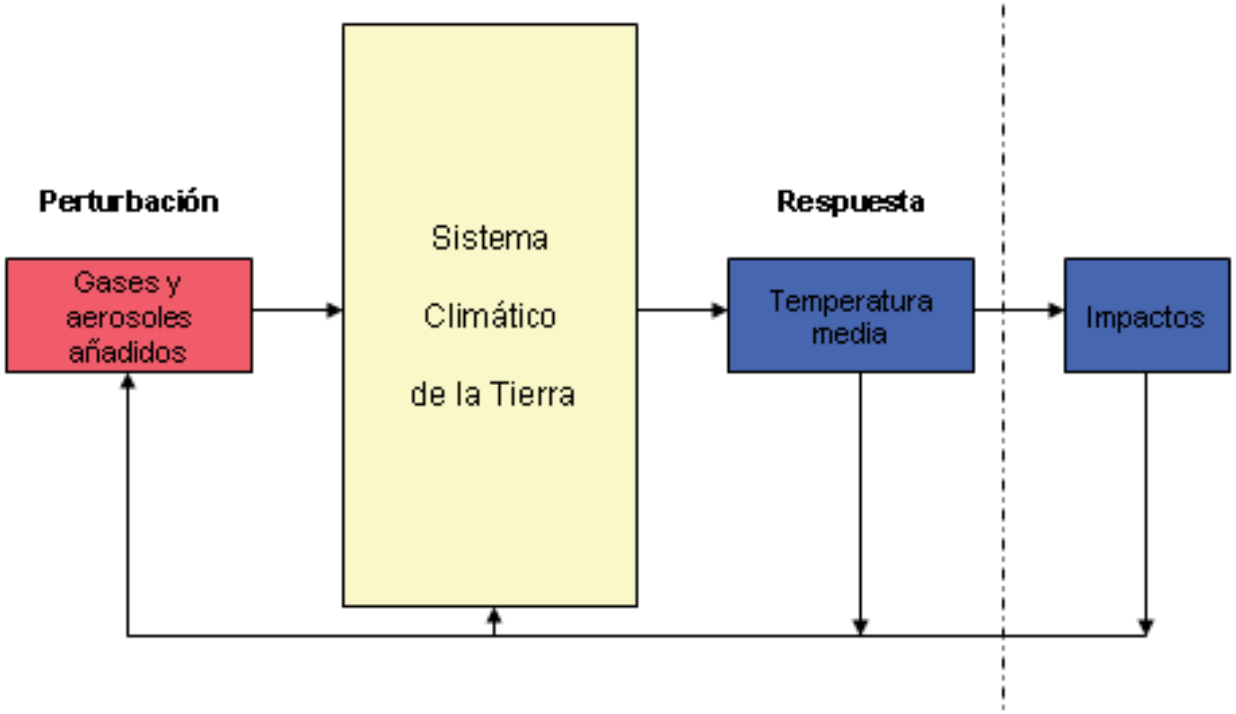


Spencer R. Weart (2003) - The Discovery of Global Warming - Harvard University Press - Published online: 01/01/2003 - Director of the Center for History of Physics, American Institute of Physics - http://www.aip.org/history/climate/index.htm

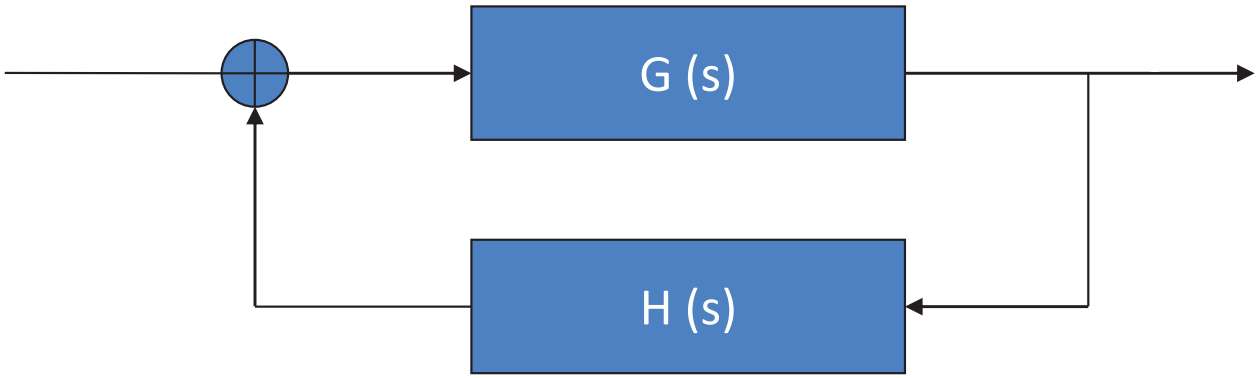


Raymond T. Pierrehumbert (2011) - Infrared Radiation and Planetary Temperature - Physics Today January 2011:33-38 - Published online: 01/01/2011 - Louis Block Professor in Geographical Sciences, University of Chicago

Perturbación – Respuesta



Realimentació

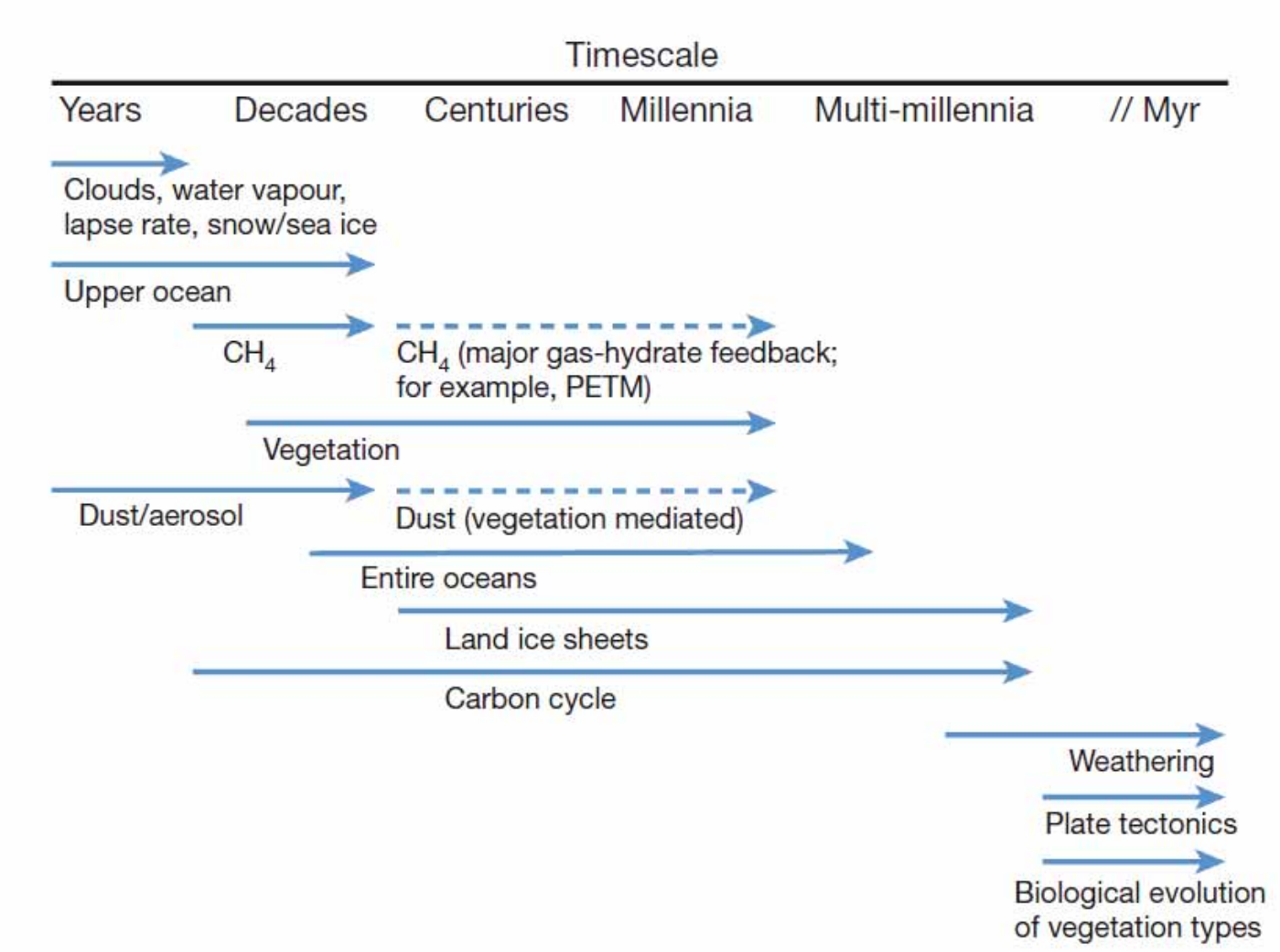


$$\frac{G(s)}{1+G(s)H(s)}$$

Previsioni

Variable	Scenario	2046–2065		2081–2100	
		mean	*likely* range [c]	mean	*likely* range [c]
Global Mean Surface Temperature Change (°C) [a]	RCP2.6	1.0	0.4 to 1.6	1.0	0.3 to 1.7
	RCP4.5	1.4	0.9 to 2.0	1.8	1.1 to 2.6
	RCP6.0	1.3	0.8 to 1.8	2.2	1.4 to 3.1
	RCP8.5	2.0	1.4 to 2.6	3.7	2.6 to 4.8
		mean	*likely* range [d]	mean	*likely* range [d]
Global Mean Sea Level Rise (m) [b]	RCP2.6	0.24	0.17 to 0.32	0.40	0.26 to 0.55
	RCP4.5	0.26	0.19 to 0.33	0.47	0.32 to 0.63
	RCP6.0	0.25	0.18 to 0.32	0.48	0.33 to 0.63
	RCP8.5	0.30	0.22 to 0.38	0.63	0.45 to 0.82

Escala de tiempo de los lazos



PALAEOSENS Project Members - Making sense of palaeoclimate sensitivity - Nature 491:683–691 doi:10.1038/nature11574 - http://www.purdue.edu/discoverypark/climate/assets/pdfs/Making sense of palaeoclimate sensitivity.pdf

Lazos rápidos, lazos lentos

Lazos rápidos

- Radiativos
  - Vapor de agua
  - Albedo hielo marino
  - Nubosidad
- Biológicos
  - Ciclo del carbono (parcial)

Lazos lentos

- Radiativos
  - Aerosoles
  - Albedos terrestres
  - Hidratos de metano
- Biológicos
  - Fracción aérea
  - Permafrost + tundra
  - Otros suelos
  - Fuego

PERSPECTIVE

doi:10.1038/nature12350

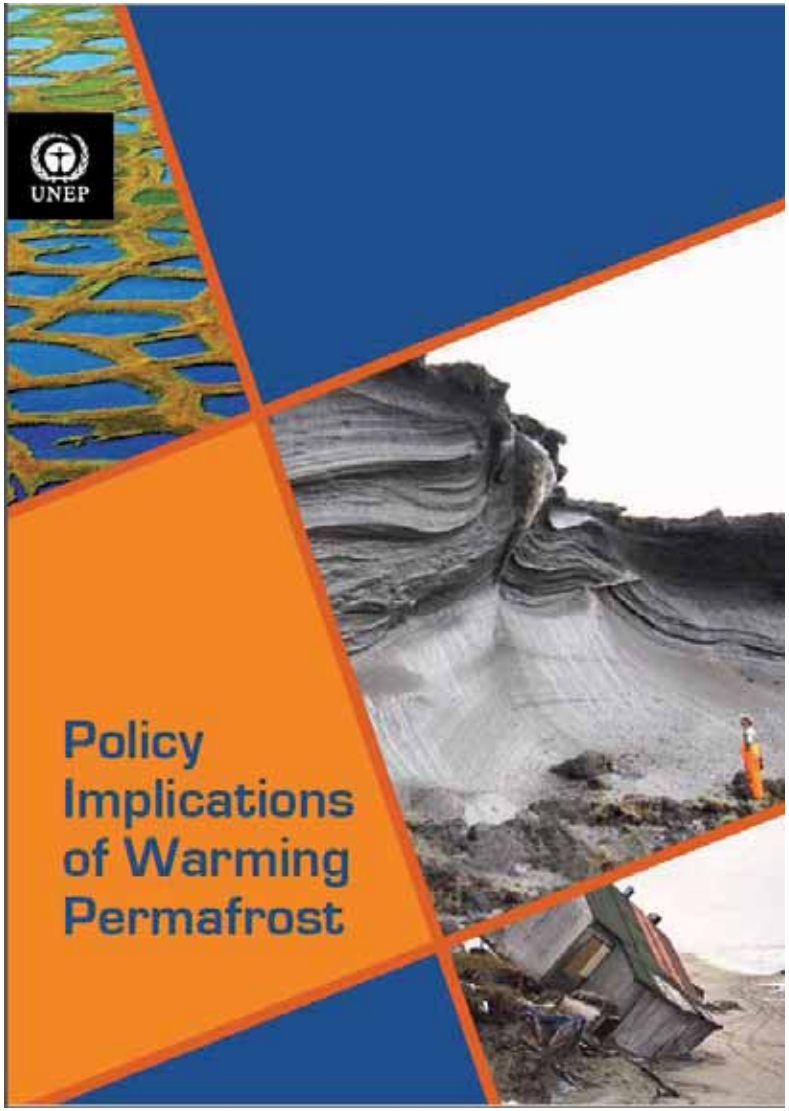
Climate extremes and the carbon cycle

Markus Reichstein[1], Michael Bahn[2], Philippe Ciais[3], Dorothea Frank[1], Miguel D. Mahecha[1], Sonia I. Seneviratne[4], Jakob Zscheischler[1,4,5], Christian Beer[1,6], Nina Buchmann[4], David C. Frank[7,8], Dario Papale[9], Anja Rammig[10], Pete Smith[11], Kirsten Thonicke[10], Marijn van der Velde[12], Sara Vicca[13], Ariane Walz[14] & Martin Wattenbach[15]

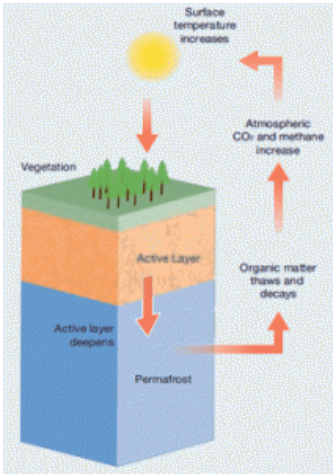
The terrestrial biosphere is a key component of the global carbon cycle and its carbon balance is strongly influenced by climate. Continuing environmental changes are thought to increase global terrestrial carbon uptake. But evidence is mounting that climate extremes such as droughts or storms can lead to a decrease in regional ecosystem carbon stocks and therefore have the potential to negate an expected increase in terrestrial carbon uptake. Here we explore the mechanisms and impacts of climate extremes on the terrestrial carbon cycle, and propose a pathway to improve our understanding of present and future impacts of climate extremes on the terrestrial carbon budget.

"Periods of extreme drought in particular reduce the amount of carbon absorbed by forests, meadows and agricultural land significantly. "We have found that it is not extremes of heat that cause the most problems for the carbon balance, but drought," explains [lead author] Markus Reichstein…. Drought can not only cause immediate damage to trees; it can also make them less resistant to pests and fire. It is also the case that a forest recovers much more slowly from fire or storm damage than other ecosystems do."

Markus Reichstein et al (2013) - Climate extremes and the carbon cycle - Nature 500:287–295 doi:10.1038/nature12350 - Published online: 14/08/2013 - Max Planck Institute for Biogeochemistry - 18 authors



"None of the climate projections in the IPCC Fourth Assessment Report include the permafrost carbon feedback (IPCC 2007). Participating modeling teams have completed their climate projections in support of the Fifth Assessment Report, but these projections do not include the permafrost carbon feedback. Consequently, the IPCC Fifth Assessment Report, due for release in stages between September 2013 and October 2014, will not include the potential effects of the permafrost carbon feedback on global climate."



Climatic Change
DOI 10.1007/s10584-009-9607-1

Carbon cycle amplification: how optimistic assumptions cause persistent underestimates of potential climate damages and mitigation needs

An Editorial Comment

Paul A.T. Higgins

Received: 31 March 2009 / Accepted: 3 April 2009

Biological systems constitute a critical, but sometimes overlooked, component of the climate system because they influence key physical characteristics of the land surface and atmosphere. For example, the absorption of solar radiation, the amount of carbon stored in plants and soil, and the partitioning of surface energy between sensible and latent heat all depend on the characteristics and functioning of vegetation at the land surface (Betts et al. 1997; Lashof et al. 1997; Sellers et al. 1997; Field and Avissar 1998; Pielke et al. 1998; Saleska et al. 2002; Feddema et al. 2005). As a result, vegetation's response to human induced climate change will likely contribute important climate feedbacks at local, regional and global scales.

Unfortunately, it's difficult to include these feedbacks accurately in climate projections because future responses of vegetation are hard to constrain using past observations and field experiments. For example, Higgins and Harte (2006) demonstrated that the strength—and in some cases even the sign—of the feedbacks on the absorption of solar radiation and the partitioning of surface energy depend on uncertain assumptions about how effectively plants will be able to migrate in

"Biological systems constitute a critical, but sometimes overlooked, component of the climate system because they influence key physical characteristics of the land surface and atmosphere …Unfortunately, it's difficult to include these feedbacks accurately in climate projections because future responses of vegetation are hard to constrain using past observations and field experiments."

Paul A.T. Higgins (2009) - Carbon cycle amplification: how optimistic assumptions cause persistent underestimates of potential climate damages and mitigation needs. An Editorial Comment - Climatic Change doi 10.1007/s10584-00 - Published online: 23/06/2009 - American Meteorological Society

nature climate change

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NATURE CLIMATE CHANGE | LETTER

Global warming amplified by reduced sulphur fluxes as a result of ocean acidification

Katharina D. Six, Silvia Kloster, Tatiana Ilyina, Stephen D. Archer, Kai Zhang & Ernst Maier-Reimer

Affiliations | Contributions | Corresponding author

Nature Climate Change (2013) | doi:10.1038/nclimate1981

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Climate change and decreasing seawater pH (ocean acidification)[1] have widely been considered as uncoupled consequences of the anthropogenic CO_2 perturbation[2, 3]. Recently, experiments in seawater enclosures (mesocosms) showed that concentrations of dimethylsulphide (DMS), a biogenic sulphur compound, were markedly lower in a low-pH environment[4]. Marine DMS emissions are the largest natural source of atmospheric sulphur[5] and changes in their strength have the potential to alter the Earth's radiation budget[6]. Here we establish observational-based relationships between pH changes and DMS concentrations to estimate changes in future DMS emissions with

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Nature Climate Change | 25 Aug 2013

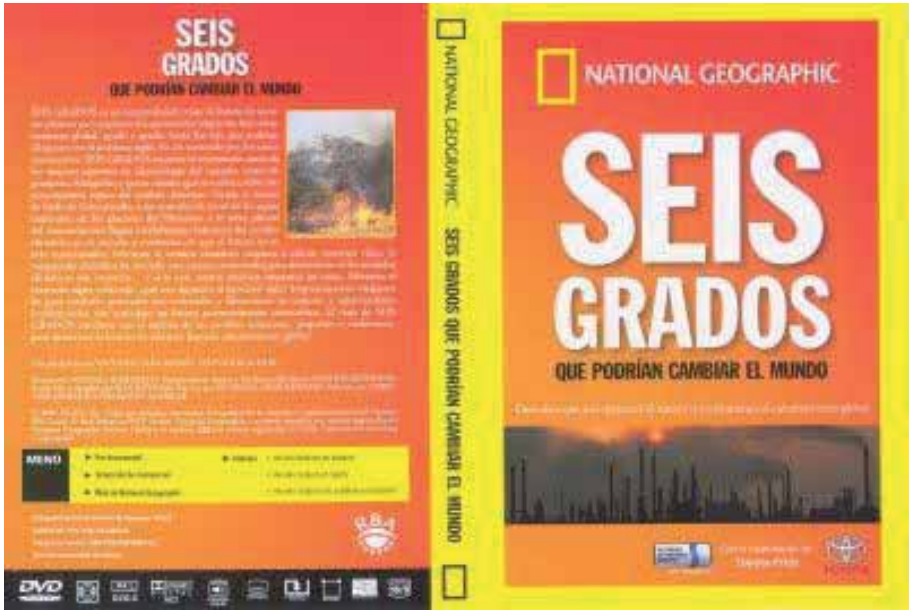
The impact of temperature on marine phytoplankton resource allocation and metabolism

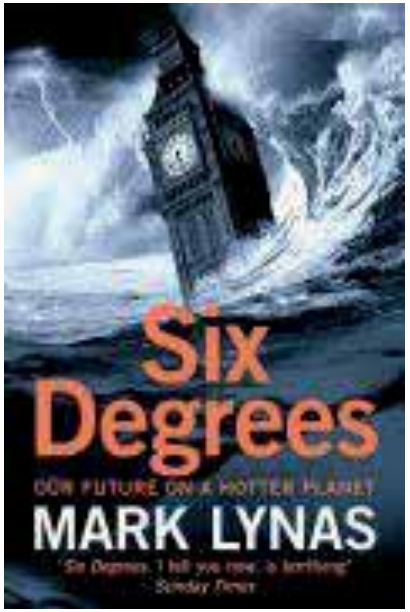
"The reduced DMS emissions induce a significant additional radiative forcing, of which 83% is attributed to the impact of ocean acidification, tantamount to an equilibrium temperature response between 0.23 and 0.48 K. Our results indicate that ocean acidification has the potential to exacerbate anthropogenic warming through a mechanism that is not considered at present in projections of future climate change."

Katharina D. Six et al (2013) - Global warming amplified by reduced sulphur fluxes as a result of ocean acidification - Nature Climate Change doi:10.1038/nclimate1981 - Published online: 25/08/2013 - Max Planck Institute for Meteorology - 6 authors

Previsión temperatura

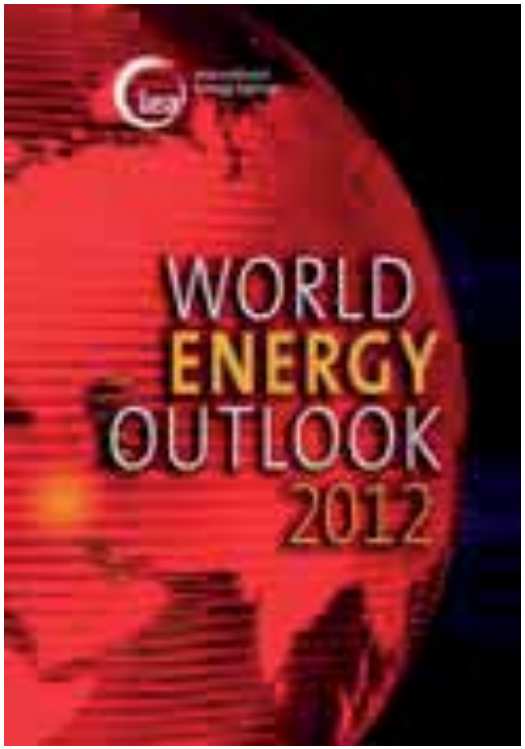
	Δ 2081-2100 (ºC)	Σ
IPCC WGI 2013 RCP8.5	3,7	
DMS	0,7	4,4
Permafrost		
Extremos		
Otros lentos		5,4
Cambio referencia	0,6	6,0


SEIS
GRADOS
QUE PODRÍAN CAMBIAR EL MUNDO
MENÚ
NATIONAL GEOGRAPHIC
SEIS GRADOS QUE PODRÍAN CAMBIAR EL MUNDO
NATIONAL GEOGRAPHIC
SEIS
GRADOS
QUE PODRÍAN CAMBIAR EL MUNDO

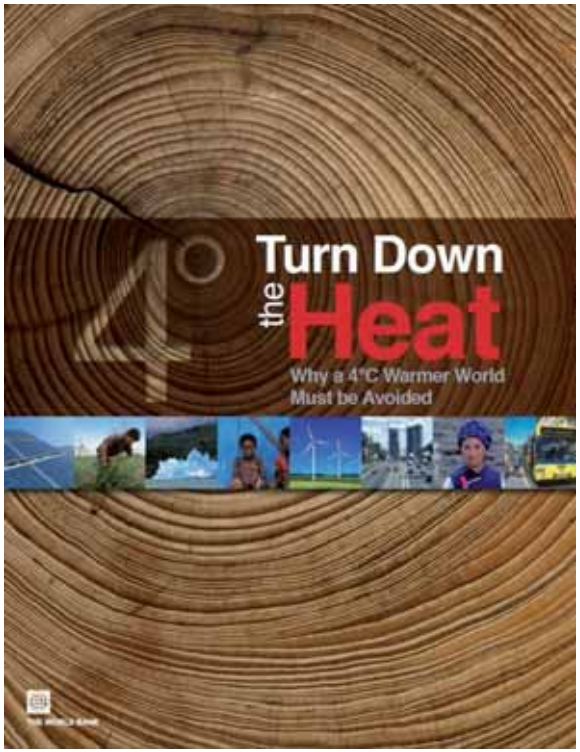

Six
Degrees
MARK LYNAS

Gaia Vince (2009) - How to survive the coming century - New Scientist, Marzo 2009 - http://www.newscientist.com/article/mg20126971.700-how-to-survive-the-coming-century.html

Governments' ambitions to limit warming to 2°C appear highly unrealistic ... **We have passed a critical threshold** … Even to have a reasonable prospect of getting to a 4°C scenario would imply nearly quadrupling the current rate of decarbonisation."



Las sucesivas ediciones de este informe han demostrado que el objetivo climático de limitar el calentamiento global a 2 °C se hace más difícil y costoso de conseguir cada año que pasa.

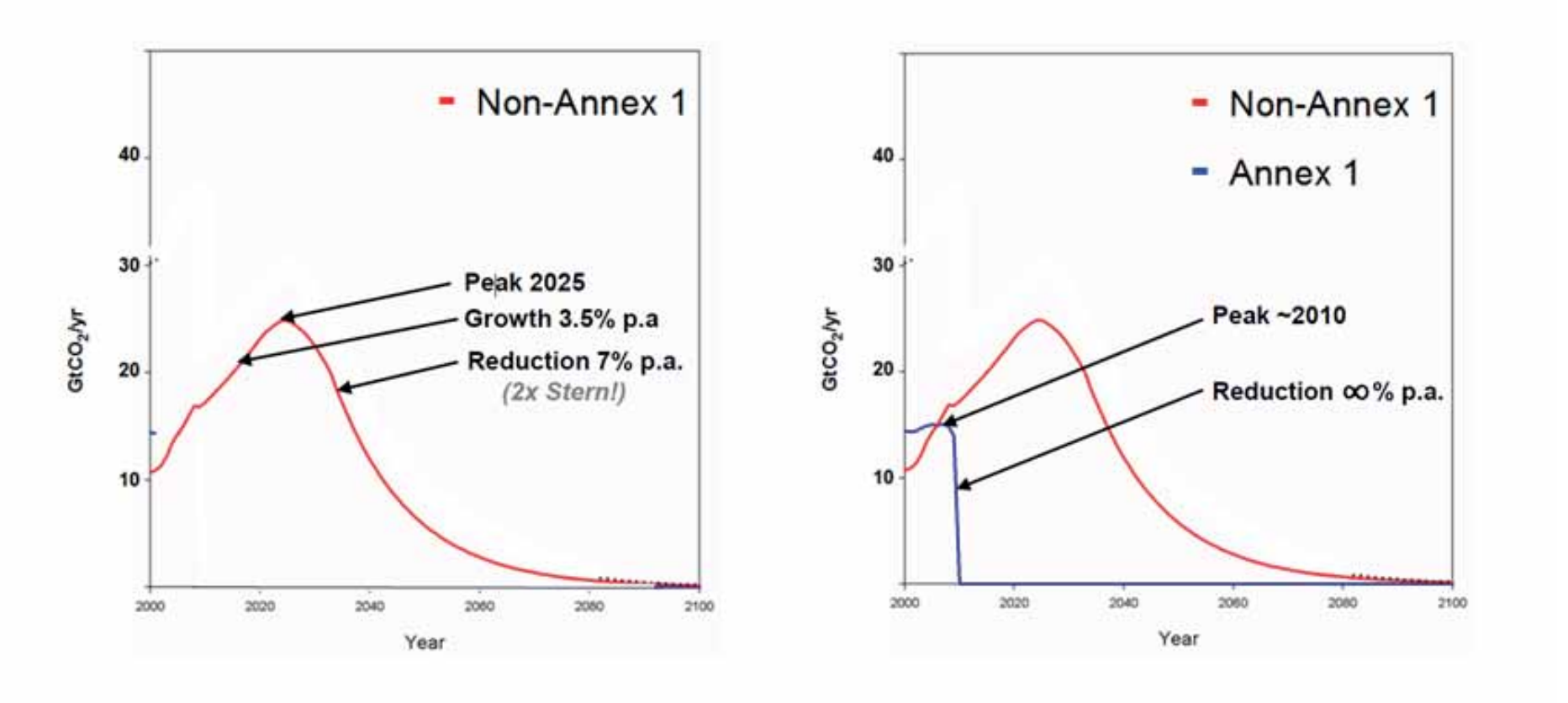


Even with the current mitigation commitments and pledges fully implemented, there is roughly a 20 percent likelihood of exceeding 4°C by 2100. **If they are not met, a warming of 4°C could occur as early as the 2060s**.

Contribución al nivel del mar

Fuente	mm/año	Gt/año	
Groenlandia	0,33	215	
Antártida	0,27	147	637
Glaciares	0,76	275	
Almacenamiento	0,38		
Dilatación	1,10		

¿Solución?



Kevin Anderson and Alice Bows (2011) - Beyond 'dangerous' climate change: emission scenarios for a new world - Philosophical Transactions of the Royal Society of London A 369:20-44 doi:10.1098/rsta.2010.0290 - Tyndall Centre for Climate Change Research + School of Mechanical, Aerospace and Civil Engineering + School of Environmental Sciences and School of Development, University of East Anglia; Sustainable Consumption Institute, School of Earth, Atmospheric and Environmental Sciences, University of Manchester

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CARTA ABIERTA

La solvencia de la ciencia climática y el panel de expertos de la ONU

Las voces discrepantes siguen sin ofrecer explicaciones científicas sólidas, ni parecen dispuestos a contribuir al debate científico por los procedimientos establecidos en cualquier área de conocimiento.

MANUEL DE CASTRO, FRANCISCO DOBLAS-REYES Y FIDEL GONZÁLEZ-ROUCO | 3 OCT 2013 - 13:48 CET

Archivado en: Opinión IPCC Cambio climático ONU Problemas ambientales Organizaciones internacionales Sociedad Ciencia Relaciones exteriores Medio ambiente

0 0 0 0

Cumpliendo el calendario previsto, el Panel Intergubernamental de expertos sobre el Cambio Climático (IPCC, según sus siglas en inglés) acaba de publicar el quinto informe de evaluación (AR5) sobre el calentamiento global observado y su posible evolución futura, utilizando los conocimientos más avanzados que posee la ciencia del clima (www.climatechange2013.org). En el informe se sintetizan, ordenan y

"Similar reproche merecen los que deforman o exageran las conclusiones de la ciencia del clima, con alarmas que obvian cautelas y pasan por alto incertidumbres. Lo más recomendable, por tanto, es la atenta lectura de los informes del IPCC, donde se emplea un lenguaje escrupuloso que pretende reflejar lo que se sabe y lo que aún no se conoce bien."


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Comunicado AEC ante las declaraciones del Presidente de AEMET
Enero 2013
La Junta Directiva de la Asociación Española de Climatología (AEC) quiere con este comunicado expresar su posición científica en relación a una entrevista al Presidente de AEMET (Agencia Estatal de Meteorología) publicada el día 25 de noviembre de 2012 por EUROPA PRESS en la sección de Política Social, donde Daniel Cano opina, entre otras cosas, que "no se sabe lo suficiente como para asegurar las cosas que se están asegurando en relación al fenómeno del cambio climático".
El mencionado comunicado puede descargarse en este archivo pdf: COMUNICADO AEC. También puede consultarse a través de nuestro facebook ASOCIACIÓN ESPAÑOLA DE CLIMATOLOGÍA
La AEC ha abierto un periodo de firmas para que aquellas personas que estén interesadas en apoyar los argumentos expresados en el comunicado puedan hacerlo. Para ello tienen que enviar un correo electrónico con su nombre y dos apellidos a la siguiente dirección: info@aeclim.org , indicando en el asunto "firmo la carta AEC".
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DON'T BE *SUCH* A SCIENTIST

TALKING SUBSTANCE IN AN AGE OF STYLE

RANDY OLSON

WRITER/DIRECTOR OF *FLOCK OF DODOS: THE EVOLUTION-INTELLIGENT DESIGN CIRCUS* AND *SizzLe: A GLOBAL WARMING COMEDY*

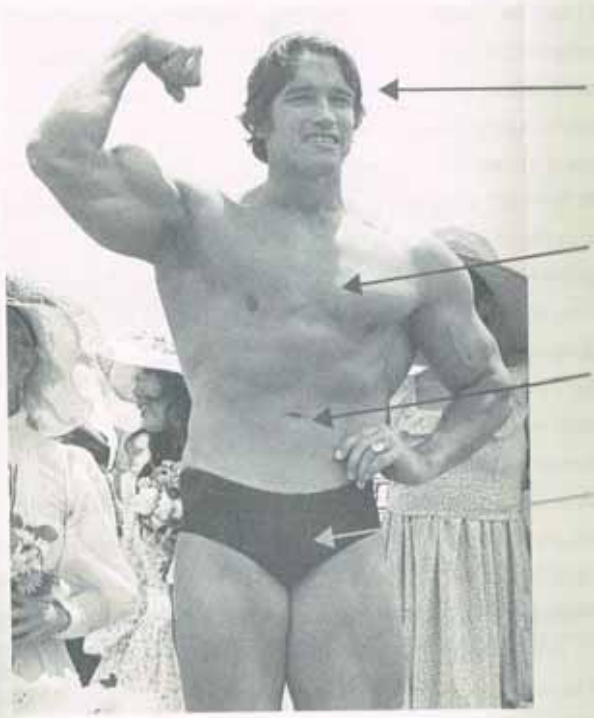

Figure 1-1. The four organs of mass communication. To reach the broadest
you need to move the process out of the *head* (1) and into the *heart* (2) with
into the *gut* (3) with humor and intuition, and, ideally, if you're sexy enough
lower organs (4) with sex appeal. Photo courtesy of © Mirkine/Sygma/Corbi

Gracias una vez más.