

# ¿La era del antropoceno?



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# Contenidos

- Revolución industrial y sus consecuencias
- Historia del concepto
- Límites planetarios
- Discusión geológica
- “A scoop”



Google anthropocene

Todo Noticias Videos Más Herramientas de búsqueda

Aproximadamente 433.000 resultados (0,55 segundos)

**Anthropocene - Wikipedia, the free encyclopedia**  
<https://en.wikipedia.org/wiki/Anthropocene> Traducir esta página  
The Anthropocene is a proposed epoch that begins when human activities started to have a significant global impact on Earth's geology and ecosystems.  
Etymology · Nature of human effects · Anthropocene temporal limit

Welcome to the Anthropocene | Welcome  
[www.anthropocene.info/](http://www.anthropocene.info/) Traducir esta página  
The Anthropocene defines Earth's most recent geologic time period as being human-influenced, or anthropogenic, based on overwhelming global evidence that ...

Anthropocene Working Group - Subcommittee on Quaternary ...  
[quaternary.stratigraphy.org/workinggroups/anthropocene/](http://quaternary.stratigraphy.org/workinggroups/anthropocene/) Traducir esta página  
The 'Anthropocene' is not a formally defined geological unit within the Geological ... Broadly, to be accepted as a formal term the 'Anthropocene' needs to be (a) ...

What is the Anthropocene and Are We in It? | Science | Smithsonian  
[www.smithsonianmag.com/.../what-is-the-anthropocene-and-are-...](http://www.smithsonianmag.com/.../what-is-the-anthropocene-and-are-...) Traducir esta página  
Anthropocene has become an environmental buzzword ever since the atmospheric chemist and Nobel laureate Paul Crutzen popularized it in 2000. This year ...

Anthropocene - Journal - Elsevier  
[www.journals.elsevier.com/anthropocene/](http://www.journals.elsevier.com/anthropocene/) Traducir esta página  
Anthropocene is an interdisciplinary journal that publishes peer-reviewed works addressing the natural scale, and extent of interactions that people have with ...

Anthropocene: The human age : Nature News & Comment  
[www.nature.com/news/anthropocene-the-human-age-1.17085](http://www.nature.com/news/anthropocene-the-human-age-1.17085) Traducir esta página  
11 mar. 2015 - This provocative exhibit will focus on the Anthropocene — the slice of Earth's history during which people have become a major geological ...

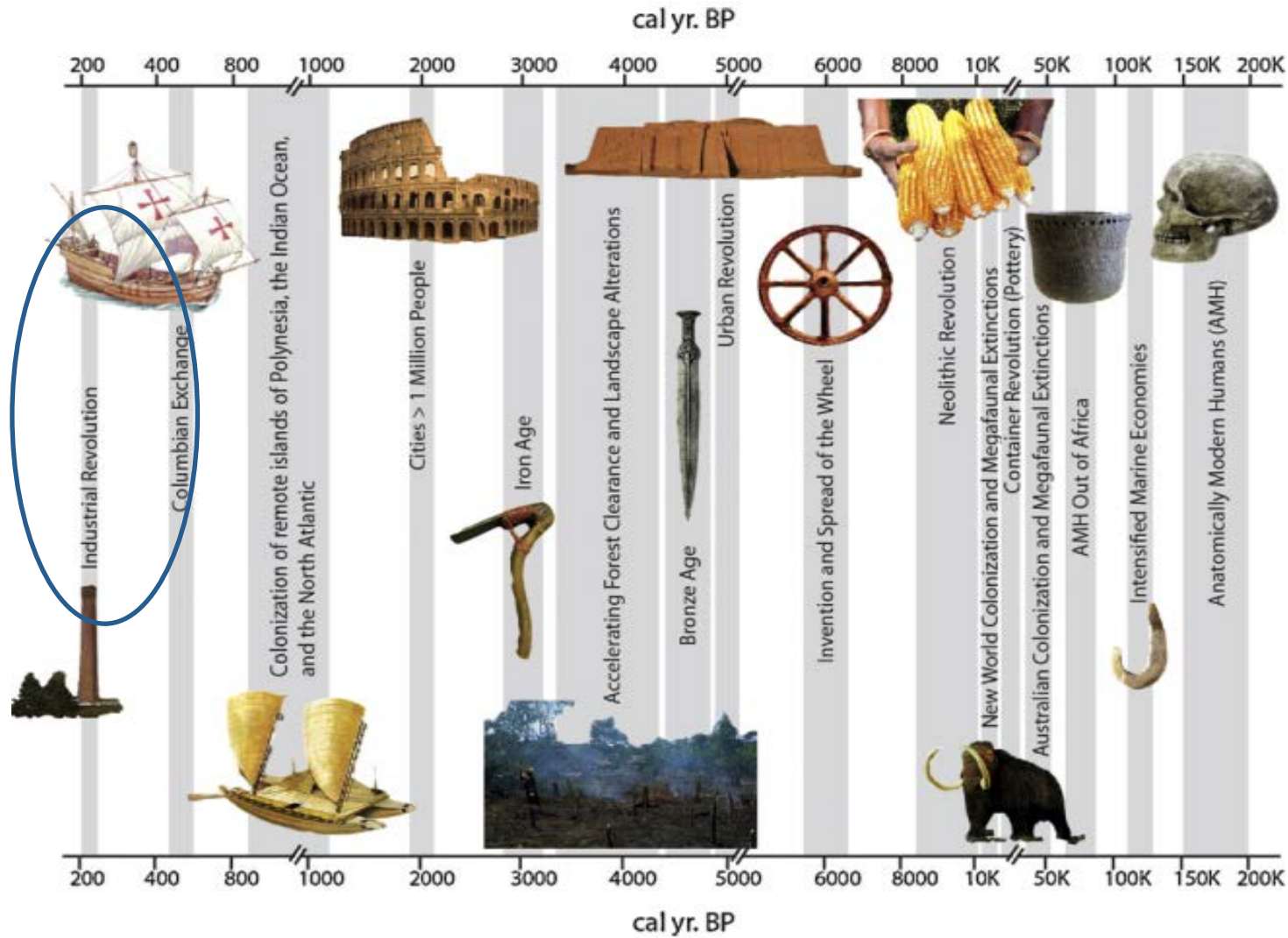
Human impact has pushed Earth into the Anthropocene, scientists say ...  
[www.theguardian.com](http://www.theguardian.com) > Environment > Pollution  
7 ene. 2016 - The question of whether humans' combined environmental impact has tipped the planet into an 'Anthropocene' — ending the current Holocene ...

The Anthropocene is functionally and stratigraphically distinct from the ...

# El sistema climático es un sistema acoplado y complejo (O no tan simple como T y P)



# Nuestra habilidad de cambiar el mundo



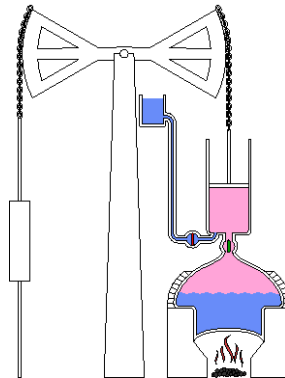
Braje, T. J. and Erlandson, J. M. 2013. *Anthropocene* 4, 116-121.

# Algunas consecuencias de la RI

## Más energía para más trabajo y más producción



James Watt (1736–1819)



- ....
- **Urbanización y reorganización social**
- **Agricultura intensiva**
- **Uso masivo de combustibles fósiles y fertilizantes sintéticos (☹)**
- ...



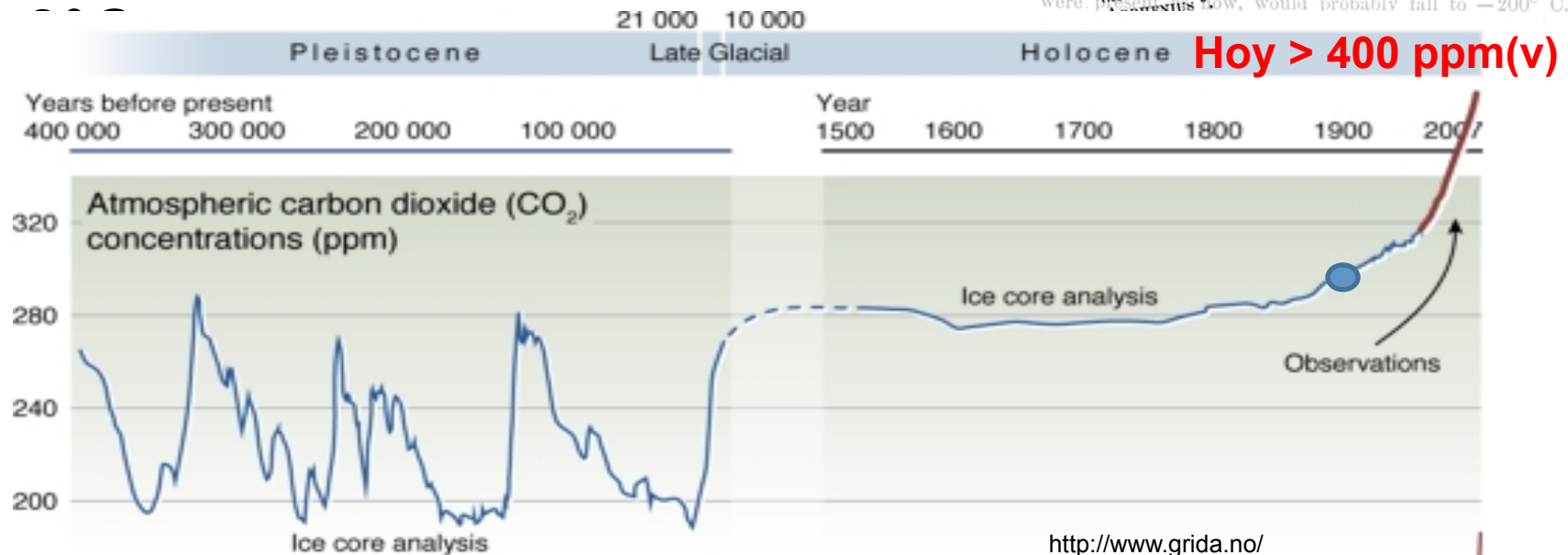
# Antes de la COP o el IPCC...

## Svante Arrhenius, 1895/6

A más CO<sub>2</sub>, más efecto invernadero y mayor T media; Pre-Ind\*2 => 5 o



PHILOSOPHICAL MAGAZINE  
AND  
JOURNAL OF SCIENCE  
[FIFTH SERIES.]  
APRIL 1896.  
XXXI. On the Influence of Carbonic Acid in the Air upon the Temperature of the Ground. By Prof. SVANTE ARRHENIUS.



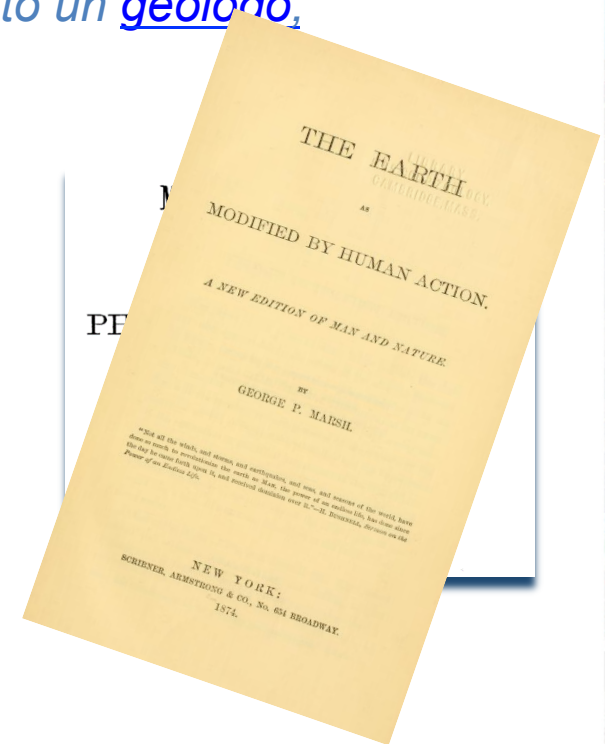
# Un concepto nuevo pero no tanto

anthropozoic era



*Antonio Stoppani (1824-1891) è stato un geologo, paleontologo e patriota italiano.*

*George Perkins Marsh (1801 – 882), an American diplomat and philologist, is considered by some to be America's first environmentalist and the precursor to the sustainability concept,<sup>[1]</sup> although "conservationist" would be more accurate.*



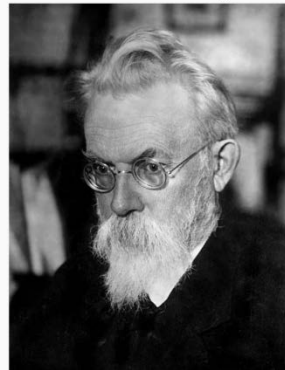
[Steffen et al., 2011]

# ...y en el siglo XX...

**Eduard Suess**



**Vladimir Vernadsky**



Biogeoquímica

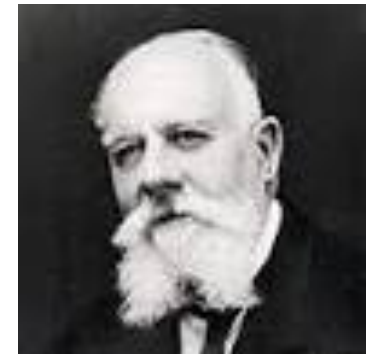
Biosphere/Noösphere  
(Anthropogenic Transformation)  
~1920's

**Pierre Teilhard de Chardin**



Geología

**E. LeRoy**



Matemática/Filosofía

[Steffen et al., 2011]

# Una foto que cambió nuestra manera de ver el mundo: Es finito



This view of the rising Earth greeted the Apollo 8 astronauts as they came from behind the Moon after the fourth nearside orbit. ..

[http://www.nasa.gov/vision/earth/features/bm\\_gallery\\_4.html](http://www.nasa.gov/vision/earth/features/bm_gallery_4.html)

# La re-introducción del concepto



Paul J. Crutzen and Eugene F. Stoermer,  
“The Anthropocene,” *IGBP Newsletter* 41  
(May 2000): 17–18.



The name *Anthropocene* (“*Planet of Man*”) for the present geological epoch of the past few centuries has been proposed for the first time by Paul J. Crutzen (1933) and Eugene F. Stoermer (1928–2000). During the 1980s, Crutzen published a study on the geological time scale, which proposed a new epoch, the *Anthropocene*, starting around 1950, marked by the “*Great Acceleration*” (the time when human activities became dominant in the Earth system). Stoermer, already a proponent of the *Anthropocene*, published a book with the title “*Man and Nature*” in 1984, in which he argued that the *Anthropocene* had begun around 1950, marked by the “*Great Acceleration*” (the time when human activities became dominant in the Earth system). Stoermer, already a proponent of the *Anthropocene*, published a book with the title “*Man and Nature*” in 1984, in which he argued that the *Anthropocene* had begun around 1950, marked by the “*Great Acceleration*” (the time when human activities became dominant in the Earth system).



major and still growing impacts of human activities on earth and atmosphere, and at all, including global, scales, it seems to us more than appropriate to emphasize the central role of mankind in geology and ecology by proposing to use the term “anthropocene” for the current geological epoch. The impacts of current human activities will continue

To assign a more specific date to the onset of the “anthropocene” seems somewhat arbitrary, but we propose the latter part of the 18th century, although we are aware that alternative proposals can be made (some may even want to include the entire holocene). However, we choose this date because, during the past two centuries, the global effects of human activities have become clearly noticeable. This is the period when data

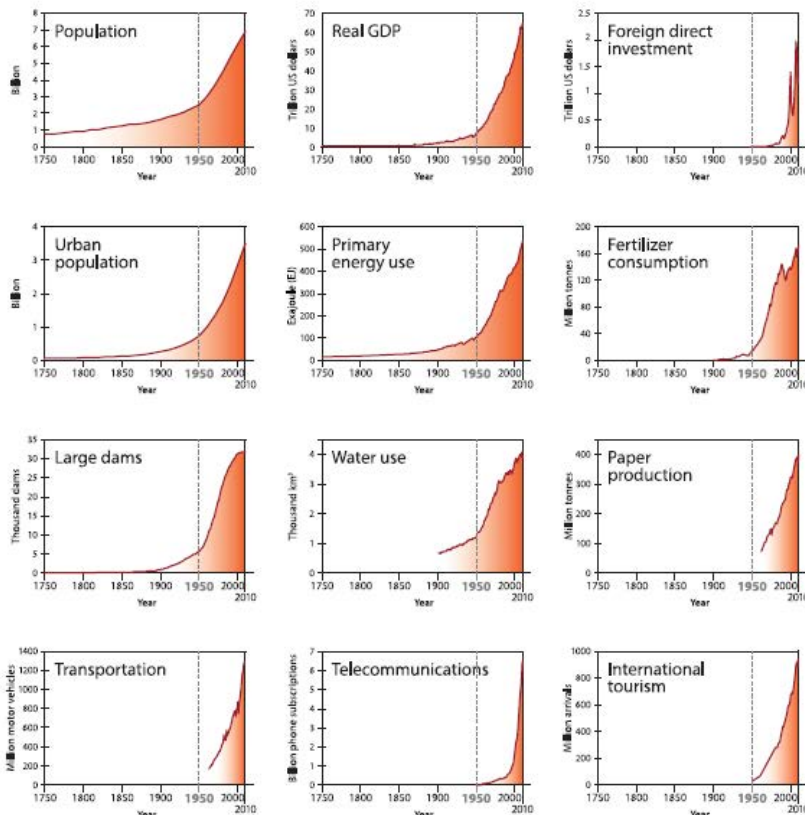
17  
1840 NOVEMBER 11  
Paul J. Crutzen  
Max-Planck-Institute for Chemistry  
Division of Atmospheric Chemistry  
P.O. Box 1015  
D-55074 Mainz  
Germany  
E-mail: crutzen@mpic.de  
Eugene F. Stoermer  
Center for Great Lakes and Aquatic  
Science  
University of Michigan  
Ann Arbor, Michigan 48106-0004  
USA

# Antropoceno y la gran aceleración

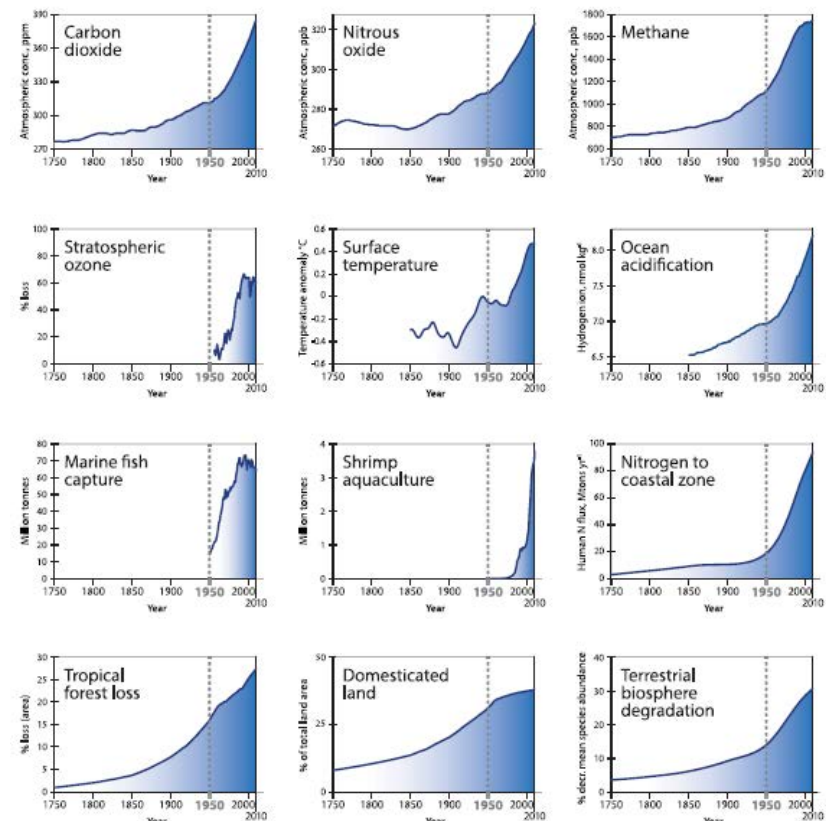
Nuestra habilidad de modificar el entorno, desde la revolución industrial, se ha transformado en un forzante comparable a los naturales (antropoceno) dando lugar a cambios que ocurren en una tasa sin precedentes en la historia humana.



## Socio-economic trends



## Earth system trends

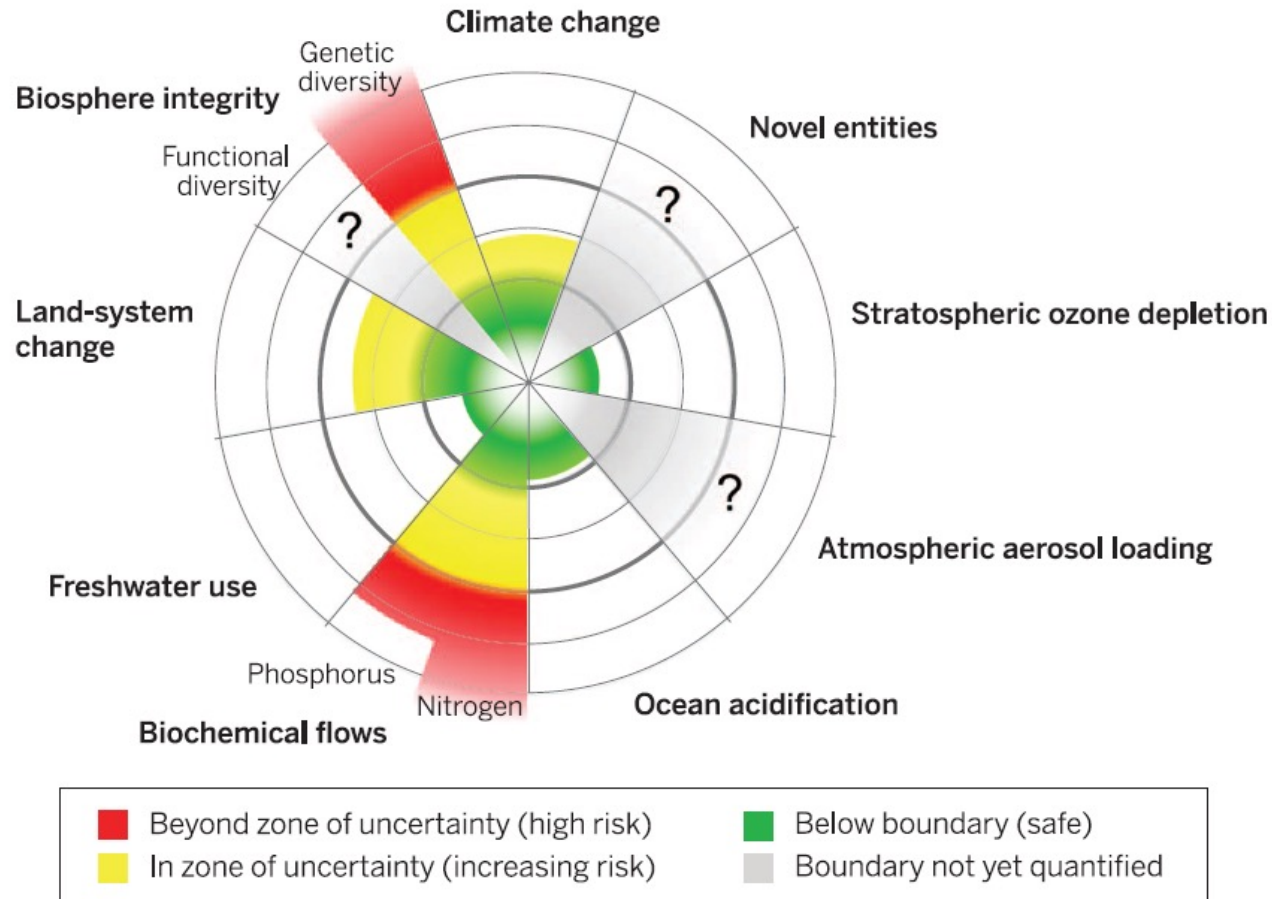


Steffen, W., et al. (2015). "The trajectory of the Anthropocene: the great acceleration." *The Anthropocene Review* 2(1): 81-98.



Center for Climate and Resilience Research  
Earth system science for Chile: a sound basis for building resilience in a changing climate

# Bordes/Límites planetarios



J. Rockström et al., *A safe operating space for humanity*. *Nature* 461, 472–475 (2009). doi: 10.1038/461472a; pmid: 19779433  
 W. Steffen et al, *Planetary boundaries: Guiding human development on a changing planet* *Science* 13 Feb 2015:Vol. 347, Issue 6223, DOI: 10.1126/science.1259855

# No a tod@s les gusta el concepto



## The geology of mankind? A critique of the Anthropocene narrative

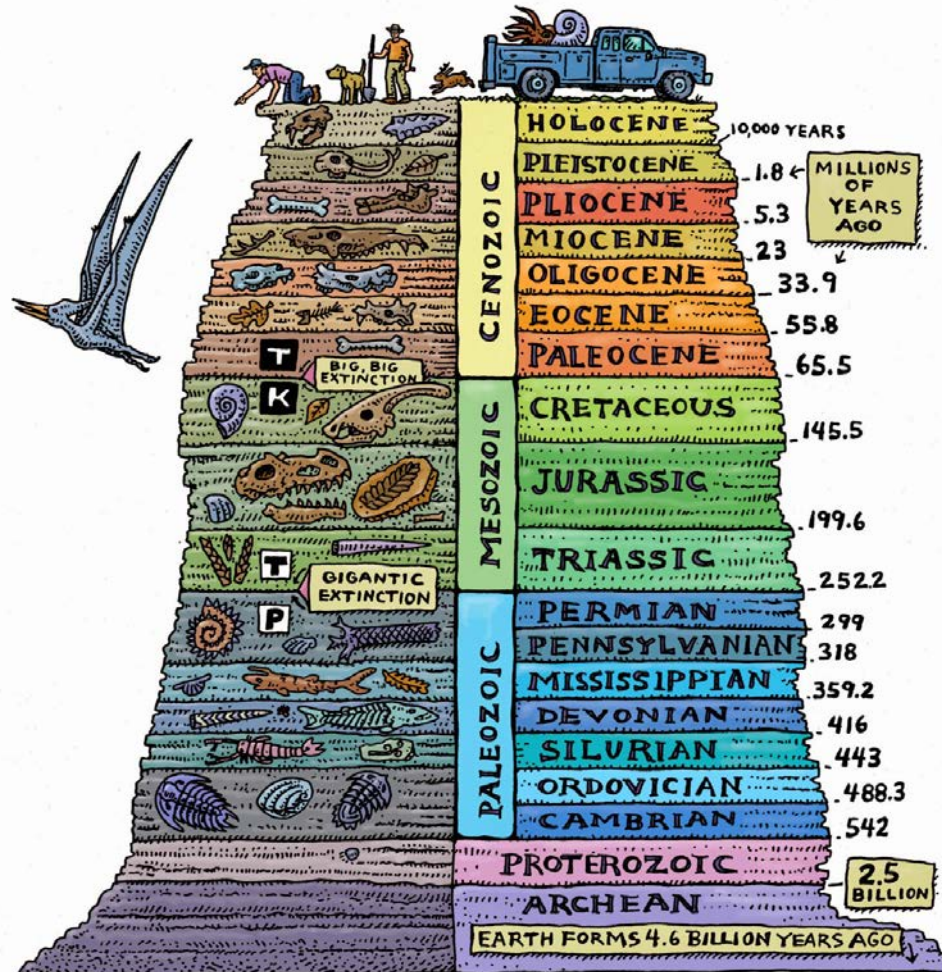
Andreas Malm and Alf Hornborg

### Abstract

The Anthropocene narrative portrays humanity as a species ascending to power over the rest of the Earth System. In the crucial field of climate change, this entails the attribution of fossil fuel combustion to properties acquired during human evolution, notably the ability to manipulate fire. But the fossil economy was not created nor is it upheld by humankind in general. This intervention questions the use of the species category in the Anthropocene narrative and argues that it is analytically flawed, as well as inimical to action. Intra-species inequalities are part and parcel of the current ecological crisis and cannot be ignored in attempts to understand it.

The Anthropocene Review  
2014, Vol. 1(1) 62–69  
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[sagepub.co.uk/journalsPermissions.nav](http://sagepub.co.uk/journalsPermissions.nav)  
DOI: 10.1177/2053019613516291  
[anr.sagepub.com](http://anr.sagepub.com)  
 SAGE

# Épocas geológicas



<http://www.geologyin.com/2015/03/epoch-defining-study-pinpoints-when.html>

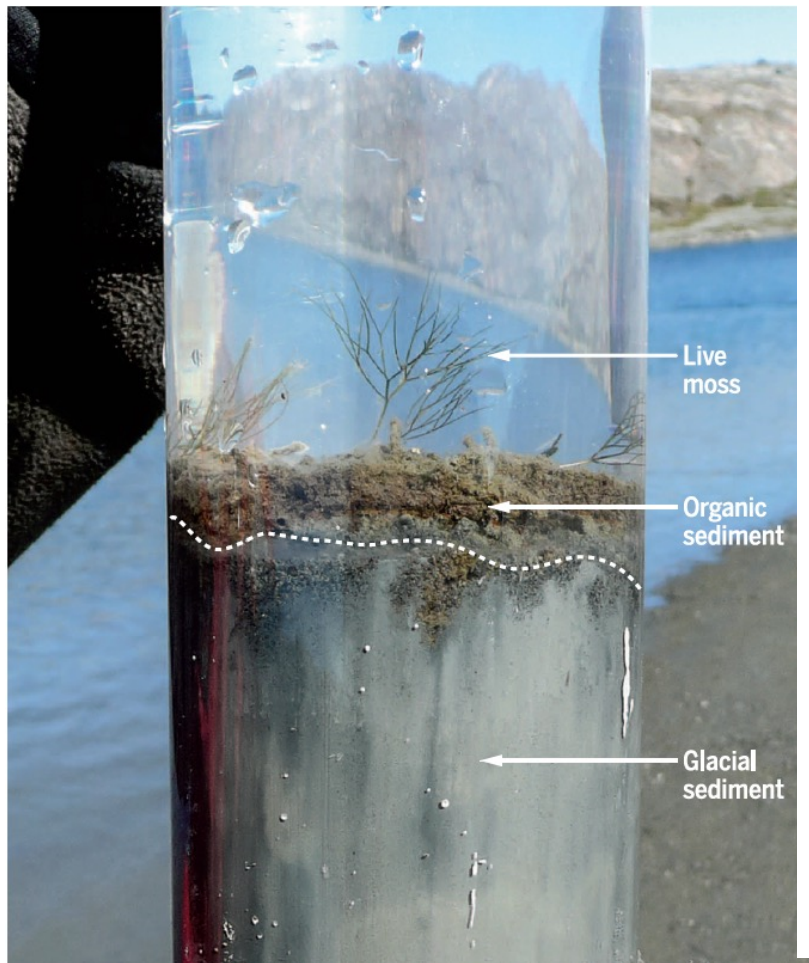
En geología se suelen caracterizar las épocas terrestres según registros estratigráficos...

Así que:

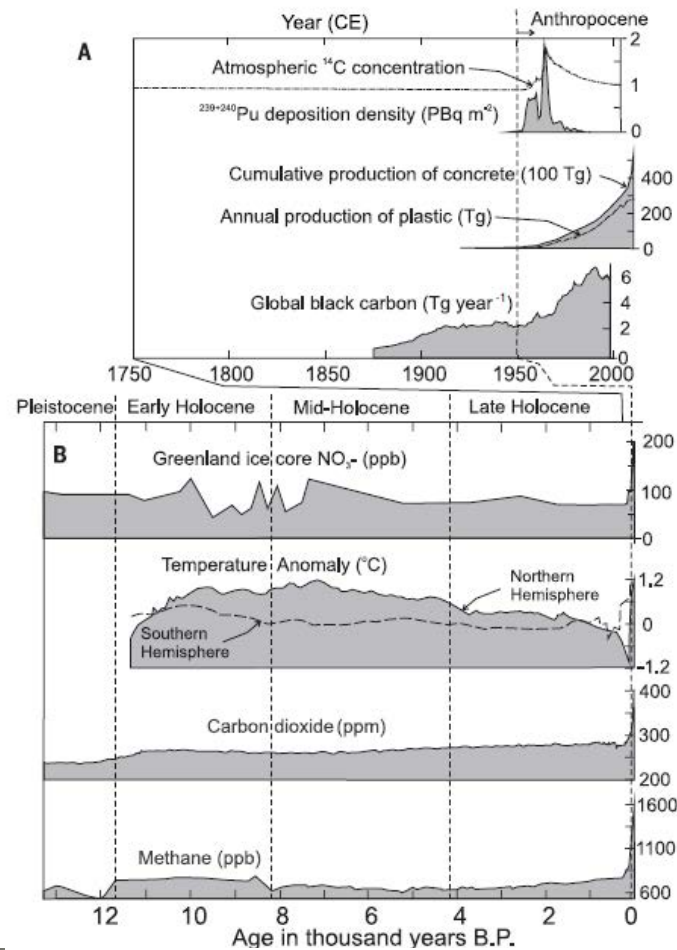
Subcommission on Quaternary Stratigraphy  
....debiera pronunciarse en 2016

POLÉMIQUE CHEZ LES GÉOLOGUES  
**MAIS DANS QUELLE ÉPOQUE VIVONS-NOUS ?**

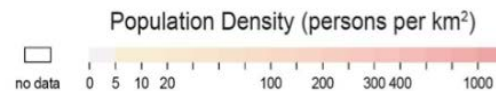
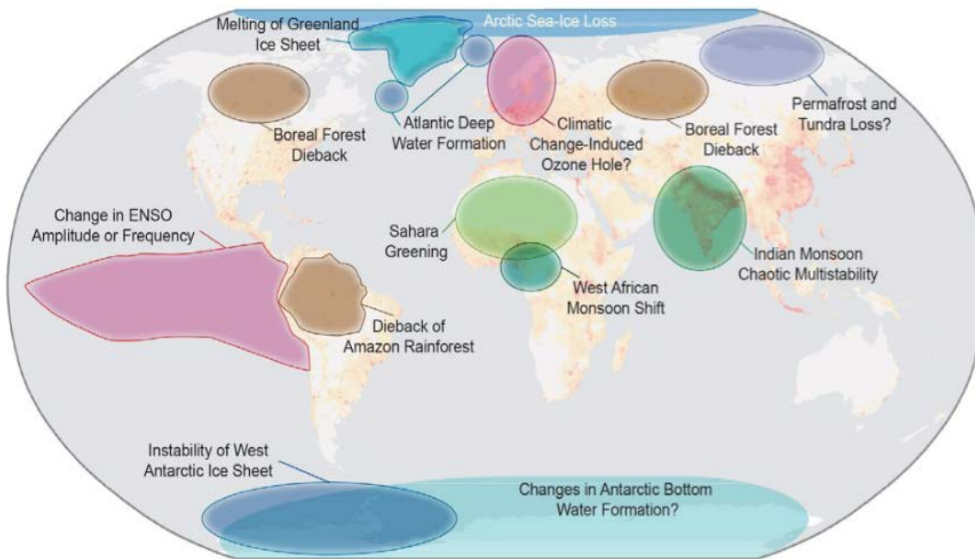
# ¿Se ve el “antropoceno”?



Waters, C. N., et al. (2016). "The Anthropocene is functionally and stratigraphically distinct from the Holocene." *Science* 351(6269): aad2622.



# Claro que...

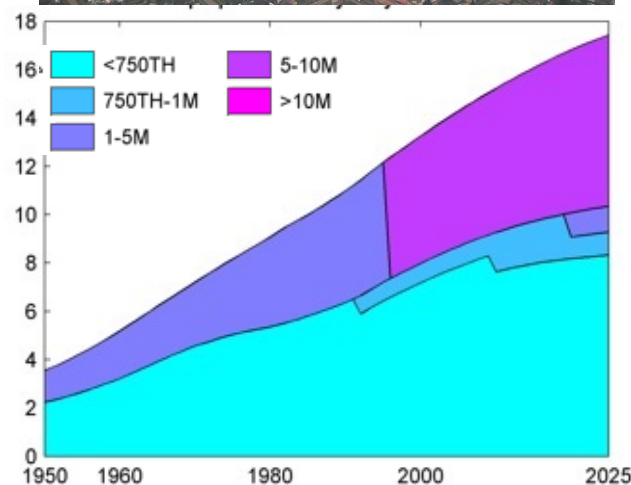
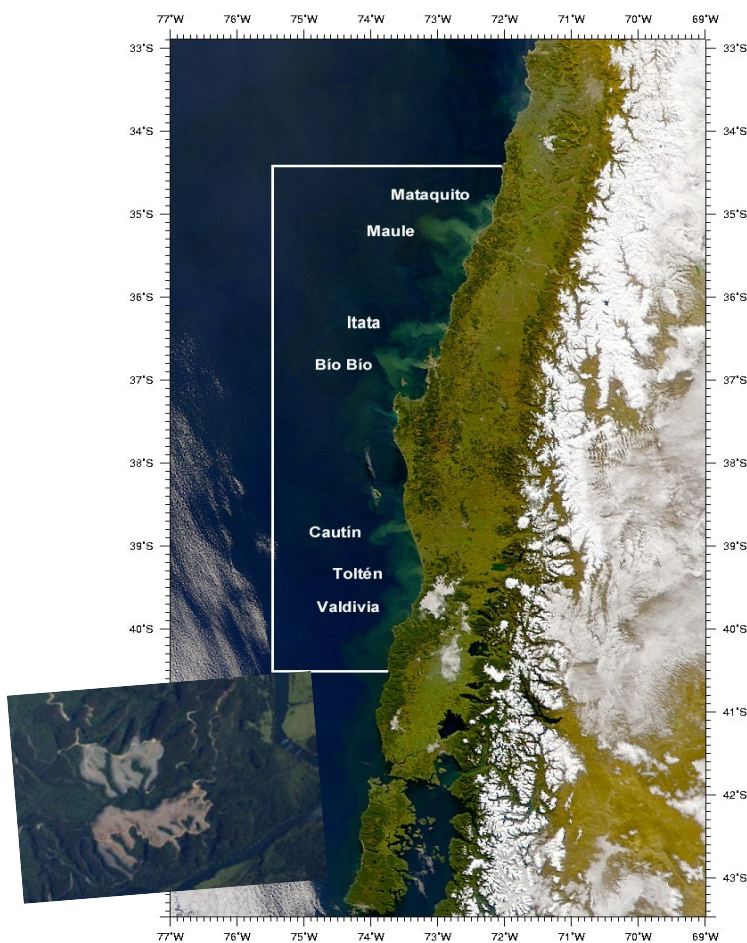


<http://nca2014.globalchange.gov/>



# Los humanos siempre hemos alterado el entorno. Lo que ha cambiado es la tasa y el carácter global de los múltiples impactos.

## Chile: Cambio de uso de suelos y urbanización



# Algunos mensajes

- Entender la relación entre human@s y naturaleza es un tema de larga data
- Nuestra habilidad de modificar el entorno, desde la revolución industrial, se ha transformado en un forzante comparable a los naturales (antropoceno) dando lugar a cambios que ocurren en una tasa sin precedentes en la historia humana.
- Tanto la datación geológica como el concepto se discuten...sin embargo, el hecho de la causa permanece... **seguimos alterando el sistema, requerimos nuevos paradigmas**



# “Scoop”

- Will Steffen visitará Chile en Agosto de 2016.



# ¡Gracias!

[laura@dgf.uchile.cl](mailto:laura@dgf.uchile.cl)

<http://www.cr2.cl/>

## Sponsoring institution



## Associated Institution



**Centro de Ciencia del Clima y  
la Resiliencia CONICYT/  
FONDAP/15110009**

## Funding Agency





## Welcome to the Anthropocene

from **WelcomeAnthropocene** **PLUS** 11 months ago / via **Final Cut Pro** **NOT YET RATED**

<http://vimeo.com/39048998>

# Material recomendado

- El antropoceno en 3 minutos

<https://www.youtube.com/watch?v=fvgG-pxlobk>

- El antropoceno en más minutos

<https://www.youtube.com/watch?v=ABZjlfhN0EQ>

- IPCC & Comunicaciones

[http://www.ipcc.ch/pdf/supporting-material/EMR\\_COM\\_full\\_report.pdf](http://www.ipcc.ch/pdf/supporting-material/EMR_COM_full_report.pdf)