

# The story of Skeptical Science

## How citizen science helped to turn a website into a go-to resource for climate science

**Bärbel Winkler – Skeptical Science**

**Dr. John Cook – George Mason University**

[\[Back\]](#) [\[Session ITS1.8/SSS1.1\]](#)

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## The story of Skeptical Science: How citizen science helped to turn a website into a go-to resource for climate science

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Skeptical Science (SkS) is a website with international reach founded by John Cook in 2007. The main purpose of SkS is to debunk misconceptions and misinformation about human-caused climate change and features a database that currently has more than 200 rebuttals based on peer-reviewed literature. Over the years, SkS has evolved from a one-person operation to a team project with science-minded volunteers from around the globe. The Skeptical Science team also actively contribute to published research, with a highlight being the often cited 97% consensus paper published in 2013 (Cook et al. 2013) for which team members content-analysed about 12,000 abstracts in a study whose publication fee was crowd-funded by readers of the website.

The SkS author community formed in 2010 in response to the proposal to expand existing rebuttals to three levels: basic, intermediate, and advanced. Since then, team members regularly collaborate to write and review rebuttal and blog articles for the website. Volunteer translators from many countries have translated selected content into more than 20 languages including booklets such as *The Debunking Handbook*, *The Uncertainty Handbook* or *The Consensus Handbook*. In addition to the already mentioned consensus study, team members have helped with other research projects initiated by John Cook such as the efforts to train a computer to detect and classify climate change misinformation. Another significant project is the Massive Open Online Course (or MOOC) “Denial101x: Making Sense of Climate Science Denial” in collaboration with the University of Queensland, for which the SkS team produced numerous video lectures and for which forum moderators were recruited. Outreach activities such as the “97 Hours of Consensus” were crowdsourced with team members collecting and organising content and providing technical support.

Challenges: Due to the volunteer nature of people’s involvement, there are some challenges involved as not everybody is available to help with tasks all the time. People help as much – or as little – as their time allows and there’s always some turn-over with new people joining while others leave.

Skeptical Science (SkS): (accessed November 29, 2019)

Cook, J., Nuccitelli, D., Green, S. A., Richardson, M., Winkler, B., Painting, R., Way, R., Jacobs, P., & Skuce, A. (2013). . *Environmental Research Letters*, 8(2), 024024+.Cook, J., Schuennemann, K., Nuccitelli, D., Jacobs, P., Cowtan, K., Green, S., Way, R., Richardson, M., Cawley, G., Mandia, S., Skuce, A., & Bedford, D. (April 2015). *Denial101x: Making Sense of Climate Science Denial*. *edX*.


Cook, J., &amp; Lewandowsky, S. (2011). . St. Lucia, Australia: University of Queensland. ISBN 978-0-646-56812-6.

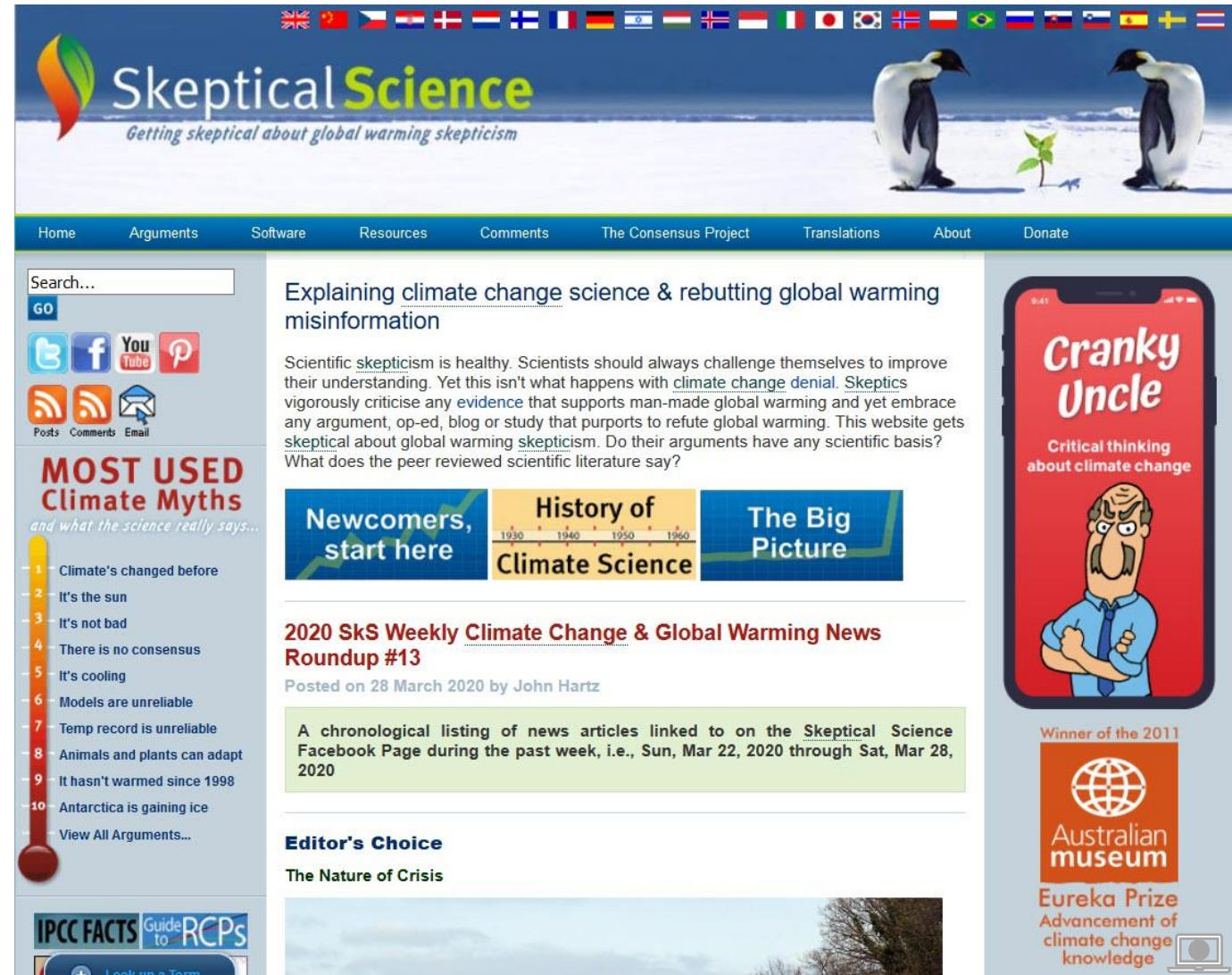


# INTRODUCTION TO SKEPTICAL SCIENCE

Skeptical Science (SkS) is a website and non-profit science education organization with international reach founded by John Cook in 2007. The main purpose of SkS is to debunk misconceptions and misinformation about human-caused climate change and features a database that currently has more than 200 rebuttals based on peer-reviewed literature. SkS has evolved from a one-person operation to a team project with volunteers from around the globe. The Skeptical Science team also actively contribute to published research, with one of the highlights being the often cited 97% consensus paper published in 2013.

A technical note:

The text and many of the graphics included in this presentation contain embedded links to internet content. In the text these links are underlined and graphics with a link show this little icon: 



**Skeptical Science**  
Getting skeptical about global warming skepticism

Home Arguments Software Resources Comments The Consensus Project Translations About Donate

Search...  
GO

Twitter Facebook YouTube Pinterest  
RSS Comments Email

**MOST USED Climate Myths**  
and what the science really says...

- 1 Climate's changed before
- 2 It's the sun
- 3 It's not bad
- 4 There is no consensus
- 5 It's cooling
- 6 Models are unreliable
- 7 Temp record is unreliable
- 8 Animals and plants can adapt
- 9 It hasn't warmed since 1998
- 10 Antarctica is gaining ice

View All Arguments...

**Explaining climate change science & rebutting global warming misinformation**

Scientific skepticism is healthy. Scientists should always challenge themselves to improve their understanding. Yet this isn't what happens with climate change denial. Skeptics vigorously criticise any evidence that supports man-made global warming and yet embrace any argument, op-ed, blog or study that purports to refute global warming. This website gets skeptical about global warming skepticism. Do their arguments have any scientific basis? What does the peer reviewed scientific literature say?

**Newcomers, start here** | **History of Climate Science** | **The Big Picture**

**2020 SkS Weekly Climate Change & Global Warming News Roundup #13**  
Posted on 28 March 2020 by John Hartz

A chronological listing of news articles linked to on the Skeptical Science Facebook Page during the past week, i.e., Sun, Mar 22, 2020 through Sat, Mar 28, 2020

**Editor's Choice**  
The Nature of Crisis

**Cranky Uncle**  
Critical thinking about climate change

Winner of the 2011 Australian Museum Eureka Prize  
Advancement of climate change knowledge

# THE MANY FACETS OF SKEPTICAL SCIENCE

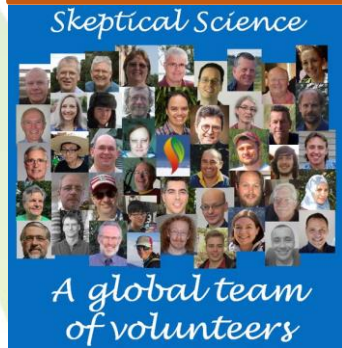
JOHN COOK



HISTORY



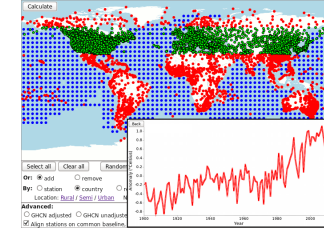
SKS-TEAM



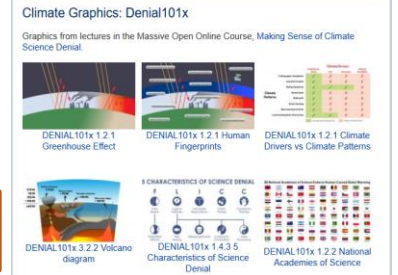
DENIAL101X



TOOLS



RESOURCES



REBUTTALS

## MOST USED Climate Myths

and what the science really says...

- 1 Climate's changed before
  - 2 It's the sun
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  - 9 It hasn't warmed since 1998
  - 10 Antarctica is gaining ice
- [View All Arguments...](#)

BLOG POSTS



CHALLENGES

SkS was hacked

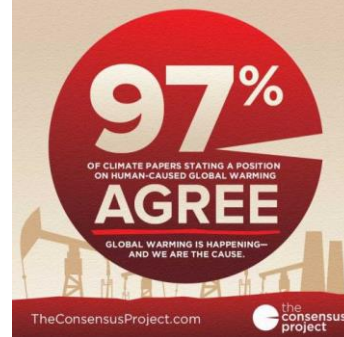
It looks like it happened

<http://tomnelson.blogspot.com/2012/03/bill-mcfibben-on-weirdest-weather.html>

I have downloaded the zip in the 1st comment but it is invalid. It won't take long for whatever is in there to be made valid and put out there. It's 18.5 MB in size

Can anyone get it open? Can someone call John immediately?

CONSENSUS



C.A.R.D.S. PROJECT

C.A.R.D.S.

Computer Assisted Recognition of Denial and Skepticism

global warming 1898 not real  
greenhouse gas models  
hiatus (too) uncertainty  
not bad change SUN  
no consensus 111.48  
fossil fuel plant food 31,000

TRANSLATIONS



RECOGNITION



LIST OF LINKS

Click on the boxes to learn more!



Skeptical Science



# SKEPTICAL SCIENCE FOUNDER JOHN COOK

John Cook originally earned a Bachelor of Science at the University of Queensland, achieving a First Class Honors with a major in physics. He obtained a PhD in cognitive psychology at the University of Western Australia, with the thesis "Closing the "consensus gap" by communicating the scientific consensus on climate change and countering misinformation". Currently, he is a research assistant professor at the Center for Climate Change Communication at George Mason University, with a research focus on developing communication and educational strategies to counter misinformation.

The roots of Skeptical Science can be traced back to early 2007, when Cook decided to create a private database as a resource to more easily counter the arguments from family members regarding anthropogenic global warming (AGW). He described the backstory in a Guardian article<sup>5</sup> in 2011:



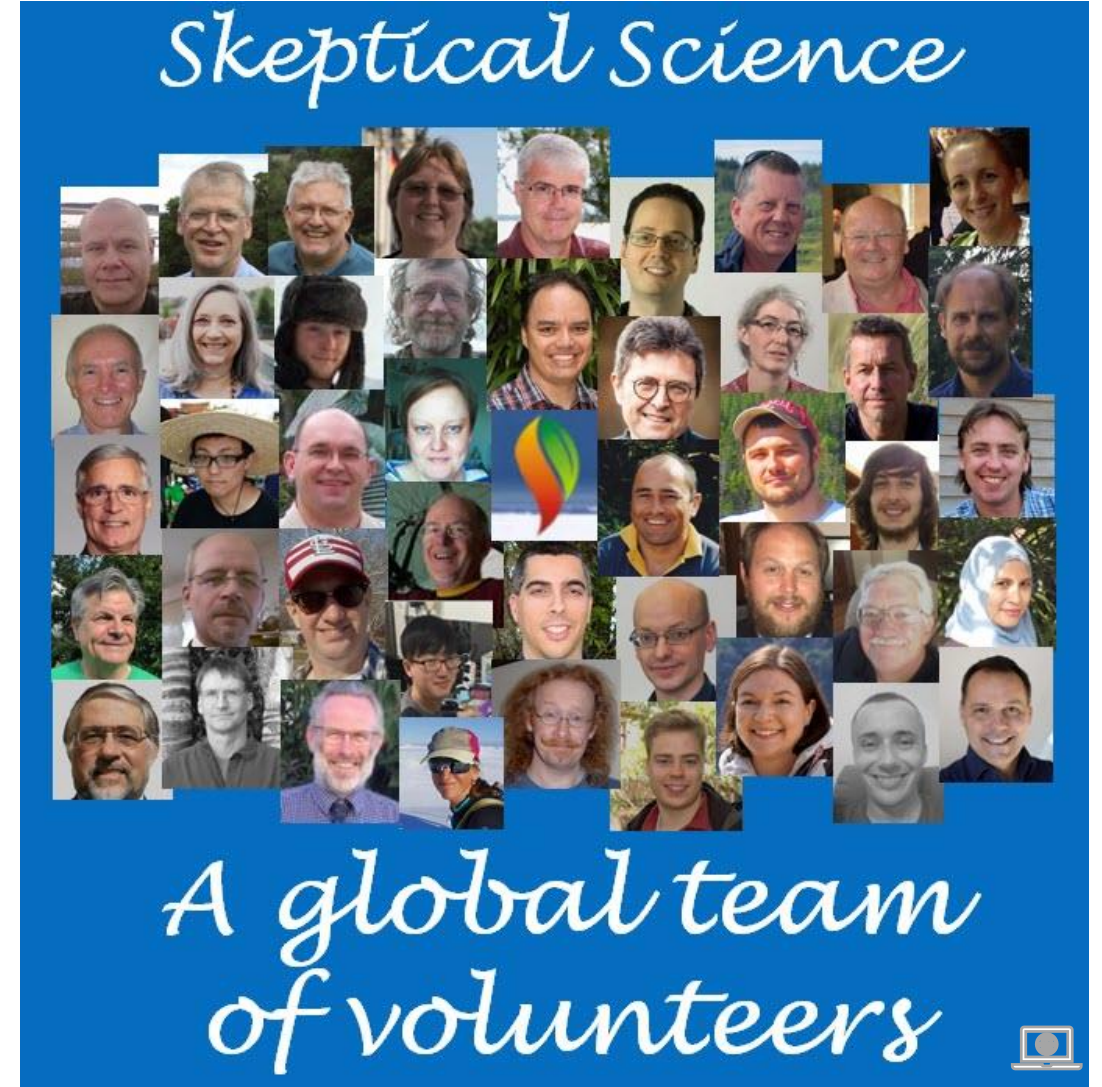
"My exploration of climate change denial began innocuously enough – namely some vigorous discussions with sceptical family members. This provoked me to dig a little deeper into the science (no one wants to lose an argument with their father-in-law), but before I knew it, I had wandered into a bewildering labyrinth of raging online debates and bottomless pits of misinformation. How to make sense of it all?"

At this point, my inner-computer geek asserted itself and I began constructing a database of climate 'sceptic' arguments. To cut to the truth of each argument, I made peer-reviewed science the ultimate authority. There's no higher standard than evidence-based research conducted by experts, which is then rigorously scrutinised by other experts. As I began to piece together the various pieces, a clear picture began to emerge."

BACK

# SKEPTICAL SCIENCE TEAM

Many people from around the globe make valuable contributions to Skeptical Science. They write blog posts, maintain rebuttals, create graphics, or author useful software tools. Furthermore, they contribute by moderating the comments sections, editing and proofreading posts, sharing information with visitors, responding to emails, and providing technical support. There are also many regular commenters whose feedback has helped to improve and hone the website's content. Volunteers from all over the world have translated selected content into more than 20 different languages. All of this work is done in the volunteer contributors' spare time and everybody helps as much as time allows and where their interests take them. Click on the picture to head to the [Welcome Page](#) on Skeptical Science!



BACK

# HISTORY OF SKEPTICAL SCIENCE - Part 1



Skeptical Science (SkS) goes live with John Cook publishing his rebuttal database in July 2007.



Twenty-something blog posts get published in what John Cook called a pretty boring year.



Skeptical Science becomes active on Facebook and Twitter. Translations are now possible.



The introduction of three levels of complexity for the rebuttals is pivotal as the author team is born.



More than 580 blog posts get written by 85 authors and SkS wins the Eureka Prize from the Australian museum.



SkS continues to increase its reach with research summaries, detailing the history of climate science and many other offerings.



Members of the SkS team publish a study finding a 97% consensus among papers stating a position on human-caused global warming.

Clicking on the buttons will take you to related material on the Skeptical Science website!

BACK

# HISTORY OF SKEPTICAL SCIENCE - Part 2



The SkS-team keeps publishing research papers and runs the „97hours of consensus“ campaign.



Collaborating with the University of Queensland the MOOC Denial101x gets launched.



SkS receives the „Friends of the Planet award“ from NCSE and members meet in San Francisco during the AGU Fall Meeting.



Skeptical Science celebrates its 10th Birthday and we can now track daily rebuttal views to better gauge interest in them.



Team members contribute to the IPCC 1.5°C report and more myth-debunking resources are published.



Our consensus paper published in 2013 hits one million downloads in July – not bad for a citizens’ science project!

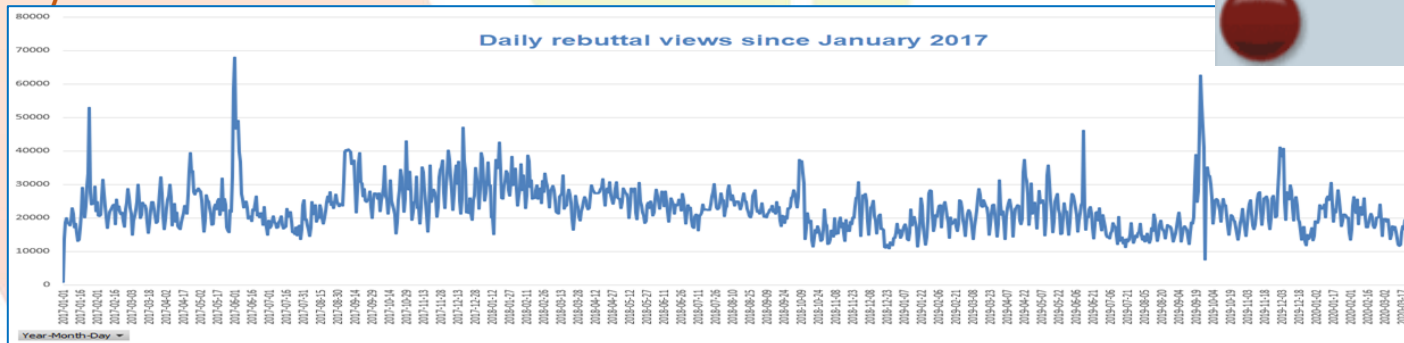
Clicking on the buttons will take you to related material on the Skeptical Science website!

BACK



# REBUTTALS

The backbone of Skeptical Science is a database with more than 200 articles rebutting misinformation about human-caused global warming. Many of the explanations exist in a basic, an intermediate, and an advanced version and all reference peer-reviewed primary research. The rebuttals tackle common misconceptions about global warming such as “It’s not happening”, “It’s not us”, “It’s not bad”, and “It’s too hard”. Some of the rebuttals are regularly viewed more than 50,000 times per month. On the homepage, the climate myths are listed by popularity (e.g. how often each argument appears in online articles) or with fixed numbers for permanent references. They are also available sorted into taxonomic categories for systematic access.



## MOST USED Climate Myths

and what the science really says..

- 1 Climate's changed before
- 2 It's the sun
- 3 It's not bad
- 4 There is no consensus
- 5 It's cooling
- 6 Models are unreliable
- 7 Temp record is unreliable
- 8 Animals and plants can adapt
- 9 It hasn't warmed since 1998
- 10 Antarctica is gaining ice

[View All Arguments...](#)

### Global Warming & Climate Change Myths

Here is a summary of global warming and climate change myths, sorted by recent popularity vs what science says. Click the response for a more detailed response. You can also view them sorted by taxonomy, by popularity, in a print-friendly version, with short URLs or with fixed numbers you can use for permanent references.

Climate Myth	vs	What the Science Says
1 "Climate's changed before"		Climate reacts to whatever forces it to change at the time; humans are now the dominant forcing.
2 "It's the sun"		In the last 35 years of global warming, sun and climate have been going in opposite directions
3 "It's not bad"		Negative impacts of global warming on agriculture, health & environment far outweigh any benefits.
4 "There is no consensus"		97% of climate scientists agree that global warming is happening and is caused by humans.

### Climate Myths sorted by taxonomy


- **It's not happening**
  - Temp record is unreliable
    - Hockey stick is broken
      - Tree-rings diverge from temperature after 1960
      - Ljungqvist broke the hockey stick
    - Dropped stations introduce warming bias
    - It's Urban Heat Island effect
    - 1934 - hottest year on record
    - It's microsite influences
    - Satellite error inflated Great Lakes temperatures
    - Satellite record is more reliable than thermometers
  - It's cooling
    - We're heading into an ice age
    - It's freaking cold!
      - 2009-2010 winter saw record cold spells
      - Record snowfall disproves global warming
        - Record high snow cover was set in winter 2008/2009
    - Oceans are cooling
    - It hasn't warmed since 1998
    - Phil Jones says no global warming since 1995
    - Global warming stopped in 1998, 1995, 2002, 2007, 2010, ????
    - BEST hides the decline in global temperature
      - No warming in 16 years
    - DMI show cooling Arctic
    - We're heading into cooling

BACK



# BLOG POSTS

Blog Posts written by team-members, or reposts from other outlets, are published on a regular basis to highlight recent research or other relevant topics relating to human-caused climate change. There are some recurring series where, for example, climate science gets explained via analogies. Recently published research articles have been listed on a weekly basis as have the articles posted to the Skeptical Science Facebook page. Readers can subscribe to receive a daily email listing the recent post(s).



The screenshot shows an email inbox on the left with several entries from Skeptical Science. The selected email is titled "Skeptical Science posts: 31 March 2020- A history of FLICC: the 5 techniques of science denial". The main content of the email includes the Skeptical Science logo, a header image of two penguins, and the text of the article introduction.

**Skeptical Science posts: 31 March 2020- A history of FLICC: the 5 techniques of science denial**

Von: Skeptical Science

01.04.2020 um 14:05 Uhr

**Skeptical Science**  
Getting skeptical about global warming skepticism

**Skeptical Science posts: 31 March 2020-**

[A history of FLICC: the 5 techniques of science denial](#)

By John Cook &

In 2007, [Mark Hoofnaagle suggested on his Science Blog Denialism](#) that denialists across a range of topics such as climate change, evolution, & HIV/AIDS all employed the same rhetorical tactics to sow confusion. The five general tactics were conspiracy, selectivity (cherry-picking), fake experts, impossible expectations (also known as moving goalposts), and general fallacies of logic.

[Read more...](#)

[Click here to unsubscribe](#)



The screenshot shows the "Skeptical Science New Research for Week #13, 2020" page. It features a header with the Skeptical Science logo and "Weekly Research Posts". Below the header, there are several sections of research articles, each with a title and a brief description.

**Skeptical Science New Research for Week #13, 2020**

Posted on 1 April 2020 by doug\_bostrom

**46 Articles**

**Physical science of global warming & effects**

Global response of evapotranspiration ratio to climate conditions and watershed characteristics in a changing environment

Greenhouse effect: the relative contributions of emission height and total absorption

**Observations & observational methods of global warming & effects**

Climate change induced a new intermittent regime of convective ventilation that threatens the Black Sea oxygenation status (open access)

Regional differences in global glacier retreat from 1980 to 2015

Long term trends (1958-2017) in snow cover duration and depth in the Pyrenees

**Modeling & simulation of global warming & global warming effects**

How could a difference of 0.5°C in global warming modify the mean and extreme climate conditions around Antarctica?

Climate change projections for the Australian monsoon from CMIP6 models

- 
- The "Latest Posts" sidebar contains a list of recent articles and resources. It includes links to YouTube's Climate Denial Problem, Skeptical Science New Research for Week #13, 2020, and various digests and roundups. It also lists resources like "Is becoming vegan the best thing people can do to reduce Greenhouse Gas emissions?" and "Fallacy Taxonomy and Icons available via Wikimedia".
- Latest Posts**
- YouTube's Climate Denial Problem
  - Skeptical Science New Research for Week #13, 2020
  - A history of FLICC: the 5 techniques of science denial
  - Scientists share their grief, anger, and hope over climate change
  - 2020 SkS Weekly Climate Change & Global Warming Digest #13
  - 2020 SkS Weekly Climate Change & Global Warming News Roundup #13
  - Aggressive action to address climate change could save the world \$145 trillion
  - Skeptical Science New Research for Week #12, 2020
  - Emissions: Coronavirus & Climate Change
  - The pros and cons of planting trees to address global warming
  - 2020 SkS Weekly Climate Change & Global Warming Digest #12
  - 2020 SkS Weekly Climate Change & Global Warming News Roundup #12
  - Is becoming vegan the best thing people can do to reduce Greenhouse Gas emissions?
  - Skeptical Science New Research for Week #11, 2020
  - UK's CO2 emissions have fallen 29% over the past decade
  - Fallacy Taxonomy and Icons available via Wikimedia



BACK



# THE SCIENTIFIC CONSENSUS

On May 16, 2013 the study "Quantifying the consensus on anthropogenic global warming in the scientific literature" led by John Cook was published in Environmental Research Letters (ERL). The paper found that among (over 12,000) peer-reviewed abstracts on the subject 'global climate change' and 'global warming' published between 1991 and 2011, over 97% of the papers taking a position on the subject agreed with the consensus position that humans are causing global warming.

Publishing the consensus study caused a stir, from being tweeted by President Obama's Twitter account, to mention in media outlets around the globe. Vigorous attacks were swift in coming as well. To preempt anticipated criticisms, a homepage for the project was set up and has been kept current with adding links to relevant material and FAQs as needed. In April 2014, Environmental Research Letters announced that the Skeptical Science consensus paper was voted ERL's best article of 2013 - a considerable outcome for a citizen science project.

97% AGREE  
OF CLIMATE PAPERS STATING A POSITION ON HUMAN-CAUSED GLOBAL WARMING  
GLOBAL WARMING IS HAPPENING—AND WE ARE THE CAUSE.

97 HOURS OF CONSENSUS

Studies into scientific agreement on human-caused global warming

100% Oreskes 2004	97% Doran 2009	97% Anderegg 2010	97% Cook 2013
91% Verheggen 2014	93% Stenhouse 2014	97% Carlton 2015	

1M DOWNLOADS

IOP Publishing @IOPublishing  
IOP Publishing and the ERL team are pleased to announce that the article 'Quantifying the consensus on anthropogenic global warming in the scientific literature' by @johnfcook et al, has become our first paper to reach over 1m downloads! [ow.ly/jo2r350v2TV](http://ow.ly/jo2r350v2TV)

ERL ENVIRONMENTAL RESEARCH LETTERS  
1 MILLION ARTICLE DOWNLOADS  
Quantifying the consensus on anthropogenic global warming in the scientific literature  
John Cook et al 2013 Environ. Res. Lett. 8 024024  
10:30 AM - Jul 17, 2019 from Bristol, England - Hootsuite Inc.

BEST ERL-PAPER IN 2013

ERL ENVIRONMENTAL RESEARCH LETTERS  
This is to certify that the article  
Quantifying the consensus on anthropogenic global warming in the scientific literature  
by John Cook, Dana Nuccitelli, Sarah A Green, Mark Richardson, Barbel Winkler, Rob Painting, Robert Way, Peter Jacobs and Andrew Skuce  
has been awarded the 'Best article of 2013' prize by the Editorial board of Environmental Research Letters, and has also been selected for inclusion in the exclusive 'Highlights of 2013' collection. Papers are chosen on the basis of referee endorsement, novelty, scientific impact and breadth of appeal.  
Daniel M. Kammen  
Professor Daniel M Kammen  
Editor-in-Chief  
Environmental Research Letters  
erl.iop.org  
IOP Publishing

BACK



# TRANSLATIONS

Since translation capabilities were added to SkS at the end of 2009, selected content has been translated into more than 20 languages by teams of volunteers working together across the globe. The individuals and teams tackling translations decide what to translate. Rebuttals are the area offering the most translations.

Translation teams have access to shared online folders in which they can prepare and proofread translations for selected content, making this a highly collaborative activity. When people voice an interest in helping with translations they can either work with others they already know or they can join an existing team for their language. The blog post Your chance to make a difference published in January 2014 outlines the many translation related activities people can contribute to: blog posts, rebuttals, and handbooks are just three of several options available.

## HANDBOOK TRANSLATIONS



## ARTICLES AND GRAPHICS

### A História da Ciência do Clima

#### Introdução

O fato do dióxido de carbono ser um "gás de efeito estufa" - um gás que impede que certa quantidade de radiação na forma de calor escape da atmosfera de volta ao espaço, e assim mantenha um clima relativamente quente na Terra - remonta a uma ideia que foi inicialmente concebida, apesar de não especificamente para o CO<sub>2</sub>, quase 200 anos atrás. A história de como esta importante propriedade física foi descoberta, como seu papel no passado geológico foi estimado e como nós viemos a entender que sua concentração crescente, pela queima de combustíveis fósseis, causaria efeitos adversos no nosso futuro, cobre aproximadamente dois séculos de pesquisa, descobertas, inovações e resolução de problemas.

#### Marcos Históricos na Ciência Climática

Identificadas as fontes de CO<sub>2</sub>, os modelos descrevem o sistema da Terra, a retroalimentação, o ciclo do carbono e o clima.

## REBUTTAL TRANSLATIONS

Sun & climate: moving in opposite directions

What the science says... [Link to this page](#)

Select a level...  Basic  Intermediate  Advanced

The sun's energy has decreased since the 1980s but the Earth keeps warming faster than before.

**Climate Myth...**

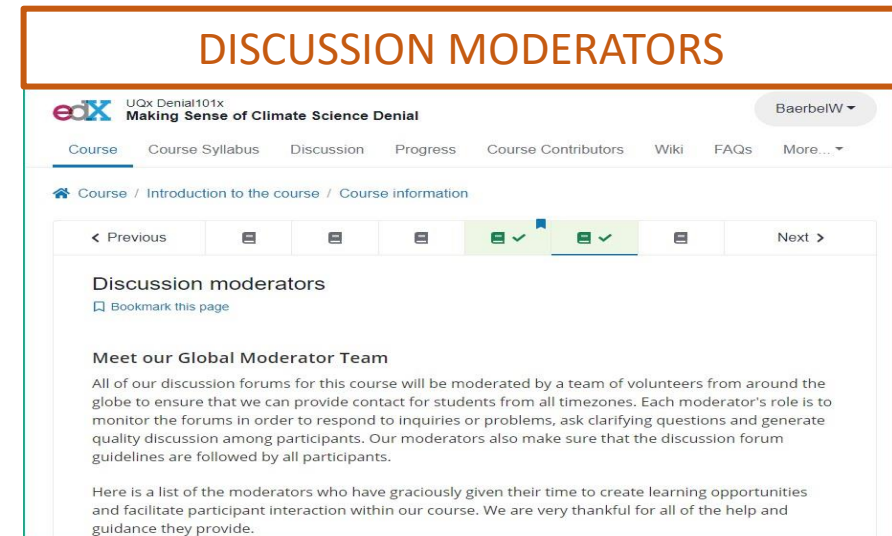
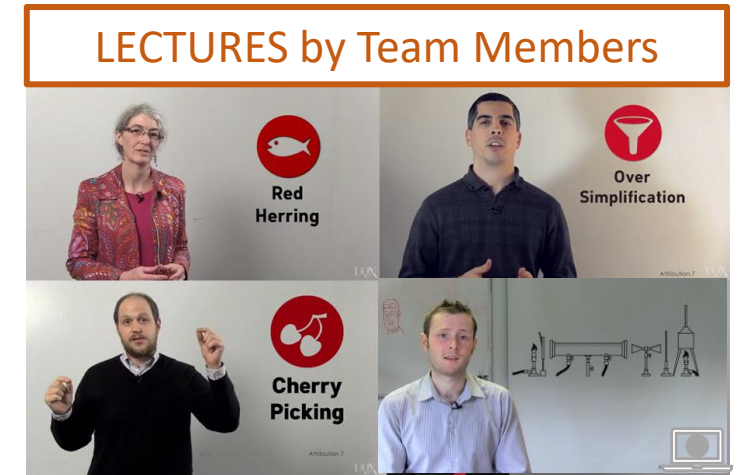
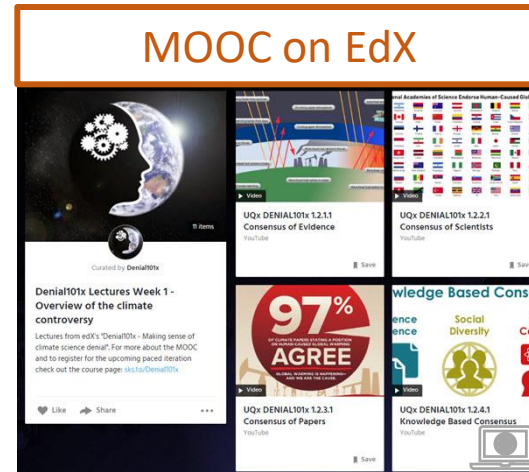
It's the sun

"Over the past few hundred years, there has been a steady increase in the numbers of sunspots, at the time when the Earth has been getting warmer. The data suggests solar activity is influencing the global climate causing the world to get warmer." (16)

BACK

# DENIAL101x – Making sense of climate science denial

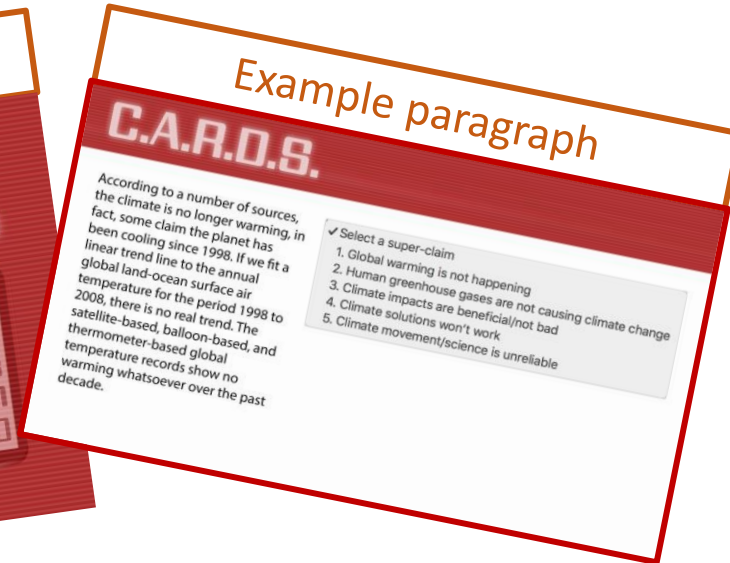
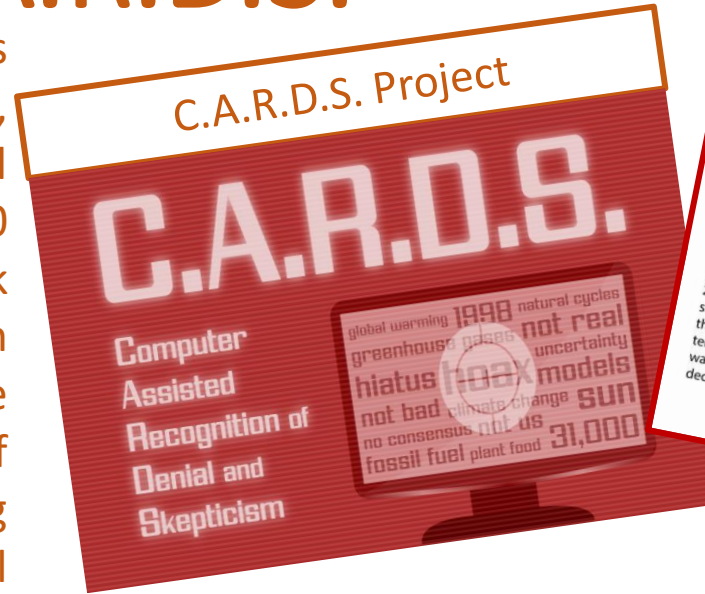
Since April 2015, SkS has offered the massive open online course (MOOC) “Denial101x: Making sense of climate science denial”. This online course is a collaboration between the Skeptical Science team and the UQx team at the University of Queensland. The 60 lectures and 40 expert interviews explain the basics of climate science while addressing common climate myths from “global warming stopped in 1998”, to “global warming is caused by the sun”, to “climate impacts are nothing to worry about”. By learning the techniques of science denial, students acquire the critical thinking needed to identify the fallacies associated with a given myth. Finally, armed with all this knowledge, participants learn about the psychology of misinformation. This is intended to equip them to effectively respond to climate misinformation. As of 2019, the MOOC has had more than 40,000 participants from over 180 countries. Members from the SkS-team provide assistance in and moderate the MOOC’s online discussion forum.



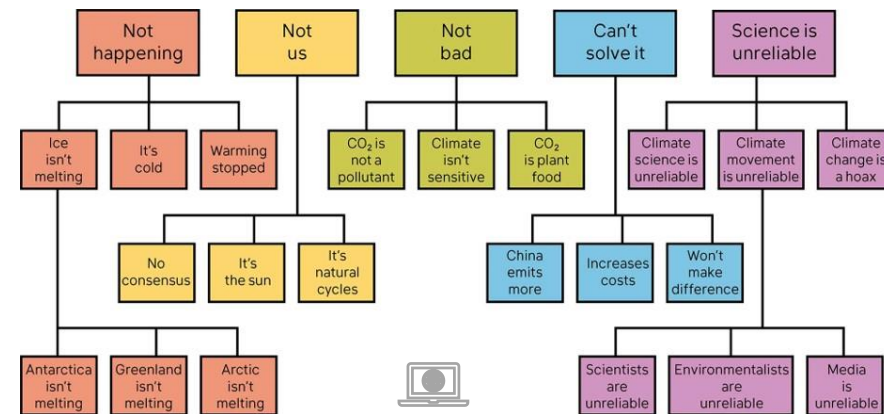
BACK

# C.A.R.D.S.

Automated detection of online misinformation is considered the “holy grail” of fact-checking, potentially offering theoretical insights and practical responses. Drawing from a corpus of over 287,000 documents from blogs and conservative think-tank websites, the Skeptical Science team worked with political scientists Travis Coan and Constantine Boussalis to develop a comprehensive taxonomy of climate misinformation. Supervised machine learning techniques to accurately detect specific skeptical claims about climate change was employed to construct a detailed history of misinformation over 17 years. Climate misinformation was found to focus predominantly on attacking the integrity of climate science and scientists, a notable result given the dearth of research into attacks on scientists. As well as offering a new approach to understanding and detecting climate science skepticism, this research lays the groundwork for developing applications that inoculate social networks against misinformation.



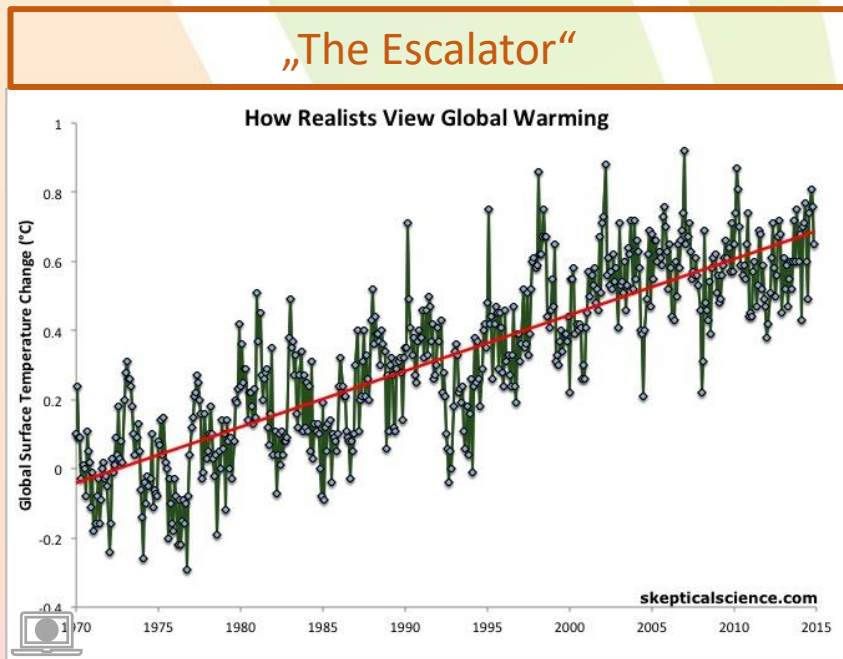
## Taxonomy of climate science denial claims



BACK

# RESOURCES

Skeptical Science features a large section of graphics and animations, licensed under creative commons to make them readily available for reuse. The graphics and animations are created by talented team members to support blog posts, rebuttals, and other materials and have been reused in books, textbooks, TV documentaries and government reports.



## Graphics

- Climate consensus and resistance
- Human fingerprints are all over our climate
- Rock Weathering CO2 Cycle (with annotations)
- Rock Weathering CO2 Cycle (no annotations)
- Future Global Warming under Business-As Usual
- Carbon Dioxide's 'Invisibility' (IS WHAT CAUSES GLOBAL WARMING)
- Invisible carbon dioxide
- Future global warming under business-as-usual
- Greenhouse Effect
- 97% AGREE
- Misinformation Blitz

## Interactive timeline

### History of Climate Science - interactive timeline

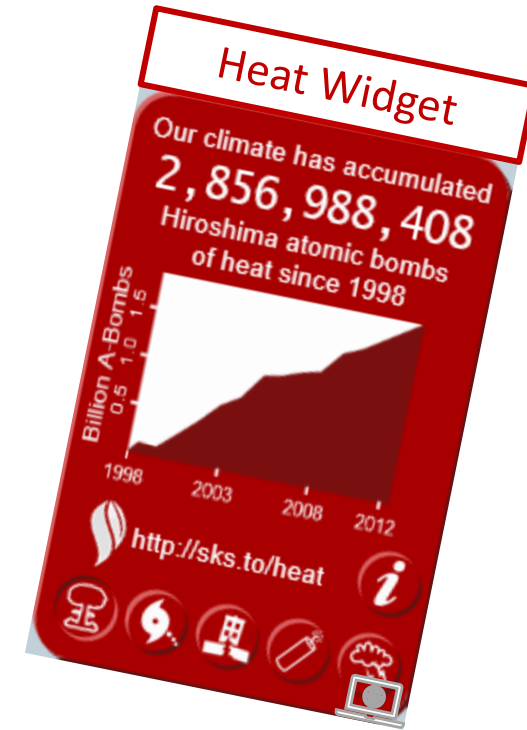
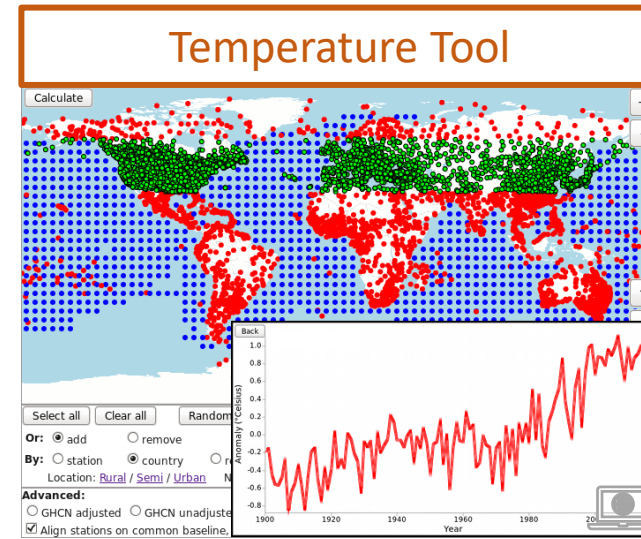
- 1960: Charles Keeling measures yearly increase in atmospheric CO2
- 1959: Bolin and Erikson report sequestration to the deep ocean can not keep up with CO2 emissions
- 1957: Hans Suess identifies isotopic fingerprint of fossil fuels in the atmosphere
- 1957: Roger Revelle examines how ocean chemistry limits uptake of CO2
- 1956: Gilbert Plass computes warming using a layered model of the atmosphere
- 1967: Manabe and Wetherald build first model of Earth's entire climate
- 1971: Rasool and Schneider model cooling effects of aerosols

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# TOOLS

Members of the Skeptical Science team have created various tools which help to put climate science into perspective like the [Temperature Tool](#) created for the MOOC Denial101x or the [Heat Widget](#) which can be added to other websites.

Since 2013, the [SkS-Glossary](#) has been available. This tool triggers pop-ups with explanations for scientific terms used in blog posts and rebuttals. The underlying definitions originated from the IPCC glossary published with its Fourth Assessment Report (AR4) in 2004. The glossary also stores and offers references for scientific papers.



The Climate Science Glossary interface is a dark blue panel with a 'Close Panel' button in the top left. It has three main sections: 'Term Lookup', 'Settings', and 'Term Lookup'. The 'Term Lookup' section has a search box and a 'Define' button. The 'Settings' section has checkboxes for 'Beginner', 'Intermediate', and 'Advanced', and a 'Definition Life' dropdown set to '20 seconds'. At the bottom, there is a small text box with a laptop icon: 'All IPCC definitions taken from Climate Change 2007: The Physical Science Basis. Working Group I Contribution to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Annex I, Glossary, pp. 941-954. Cambridge University Press.'

The 'Glacier' pop-up has a title bar with '[ close all ]' and a close button. The definition reads: 'A mass of land ice that flows downhill under gravity (through internal deformation and/or sliding at the base) and is constrained by internal stress and friction at the base and sides. A glacier is maintained by accumulation of snow at high altitudes, balanced by melting at low altitudes or discharge into the sea. See **Equilibrium line**; **Mass balance**.' Below the definition is the text 'Definition courtesy of IPCC AR4.'

The 'Consensus on consensus' pop-up has a title bar with '[ close all ]' and a close button. The definition reads: 'Consensus on consensus: a synthesis of consensus estimates on human-caused global warming'. Below the definition is the text 'Cook, J., Oreskes, N., Doran, P. T., Anderegg, W. R., Verheggen, B., Maibach, E. W., ... & Nuccitelli, D. (2016). Consensus on consensus: a synthesis of consensus estimates on human-caused global warming. Environmental Research Letters, 11(4), 048002. Link to paper'. Below that is the DOI: 'DOI: http://dx.doi.org/10.1088/1748-9326/11/4/048002'.

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# CHALLENGES

Being a volunteer-based organization, Skeptical Science faces issues and challenges other such organizations do, like lack of time due to other commitments or trouble to find helping hands for specific time-consuming but rather mundane tasks like fixing broken links or keeping the published material as current as possible.

Being a popular go-to resource regarding human-caused climate change and tackling the misinformation about it has made Skeptical Science the target of various forms of attacks. There are ad hominem attacks on the team and individual members and various conspiracy theories about the website's funding can be found online. To wit: there's no funding apart from some PayPal donations!

One particular event needs to be mentioned: In 2012 the Skeptical Science website was hacked and content from the private author forum was posted online. To this day, it is quote-mined by interested parties to make the team look bad.

"SkepticalScience seems to becoming the ringleader for conspiratorial activities by the green climate bloggers."

"I worked out recently it's impossible for one man to turn out a constantly updating and slick as grease website 'in his spare time'. I even went as far as to surmise he may just be a front for the IPCC or Globe International as it would need a team of professionals to create such a site and probably a few PR experts at the head."

"...a well known billionaire is funding the pseudo science blog sceptical science. That billionaire is a multiple convicted felon who worked willingly for the Nazis in WWII. How is *that* not headline news?"

"I worked out recently it's impossible for one man to turn out a constantly updating and slick as grease website 'in his spare time'. I even went as far as to surmise he may just be a front for the IPCC or Globe International as it would need a team of professionals to create such a site and probably a few PR experts at the head."

**A Hack by Any Other Name — Part 2**  
Posted on 26 February 2014 by Bob Lacatena

Part 1 recounts the initial step of the hacker, and our initial discovery of his intrusion

**Angela: They hack into computers and they cause this chaos.**  
— *The Net* (1995) —

March 24, 2012 — 1:06 AM AEDT — The Early Conversation

Meanwhile, the real forum suffered through a torrential storm of activity on the "SkS was hacked" thread.

24 Mar 2012, 1:06 AM	SkS was hacked
grypo	It looks like it happened <a href="http://tomnelson.blogspot.com/2012/03/bill-mcfibben-on-weirdst-weather.html">http://tomnelson.blogspot.com/2012/03/bill-mcfibben-on-weirdst-weather.html</a> I have downloaded the zip in the 1st comment but it is invalid. It won't take long for whatever is in there to be made valid and put out there. It's 18.5 MB in size Can anyone get it open? Can someone call John immediately?
24 Mar 2012, 1:13 AM	Alex C
24 Mar 2012, 1:20 AM	Alex C

Just downloaded it, what the F\*\*K, all my information is in there, contact and IP- everyone else's too.  
It's valid Grypo. It's a whole bunch of what seems like screenshots of everything - but it's strange, the dates span from 2010...

March 27, 2012 — 9:45 AM, AEDT — Nerves

At 9:45 AM John reported yet another SQL injection attack consisting of 49 distinct queries, originating from Jakarta, Indonesia. It was probably harmless, especially considering that we'd already been hacked, but it certainly added to our nerves. We'd also received a foolish, taunting e-mail — one quickly traced to someone in Houston, Texas, someone who hadn't the desire or skill to hide is IP address. It was obviously not from the hacker, but it demonstrated the mind-set of the people who were enjoying the fact that we'd been hacked:

Date: 26 March 2012 2:18:31 AM AEST  
Name: Hacked?  
Email: Hacked@gmail.com  
Message: There is more to come and you will not like it.

A little later — just after midnight in Seattle — Doug also discovered that the SQL injection log file from February 21st was corrupted. Every log file begins with entries on or moments after 00:00:00 on that day, denoting the first activity on a site that is in constant use, around the world and around the clock. But the log file from February 21st started with a query at 12:07 PM. Twelve hours were inexplicably missing from that log file, although the explanation for why the file was incomplete was obvious. The hacker had truncated the file to cover his tracks.

What had the hacker done during those missing twelve hours?

*Part 6 describes the methods used by the hacker and details his activity on February 21st.*

**To be continued...**

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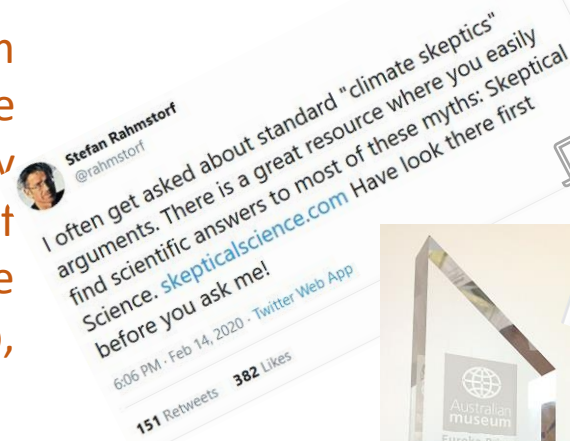


# RECOGNITION

In September 2011, the SkS team won the Eureka prize from the Australian museum, for the advancement of climate change knowledge. The Eureka Prize, presented annually since 1990, has been described as Australia's "Oscars of Science". The prize recognizes and rewards excellence in the fields of scientific research & innovation, science leadership, school science, and science journalism & communication.

The National Center for Science Education (NCSE)—a large non-profit organization supporting teachers in the U.S. who want to teach evolution and climate science without interference from religious or political groups—named Skeptical Science as one of 2016's recipients of their Friend of the Planet Awards.

Many scientists regularly refer others to Skeptical Science as the go-to-resource for questions about climate science and to look for debunkings to regularly heard misinformation. A collection of endorsements is available on the homepage.



"Skeptical Science is a fantastic resource for debunking misinformation about climate change. The articles and materials are all grounded in the scientific literature, and presented in an approachable and understandable way. It is a particularly helpful resource for helping students and other young people separate the facts from the myths."

## Simon Donner

Professor, Department of Geography, University of British Columbia



"I used John Cook's SkepticalScience.com as the student resource for this semester's research papers. As you will see from the [four example papers highlighted on this blog](#), information found at SkepticalScience.com is accessible to the typical college student and likely to the general public."

## Scott Mandia

Professor of Global Climate Change, Suffolk Community College

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Skeptical Science



# AUTHOR INFORMATION

Bärbel Winkler  
Skeptical Science  
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Fellbach, Germany



Bärbel Winkler lives and works in Germany. She has always had a lot of interest in environmental issues and has been active as a volunteer at the local zoo and a conservation group for many years. Over time and while learning more and more about it, Bärbel became increasingly aware and concerned about climate change and what it will mean for generations to come. As a means to turn her concerns regarding climate change into something productive, Bärbel joined the Skeptical Science team in 2010 and started translating selected content into German. Since 2013 she has been coordinating the translation efforts for all languages, contributes a blog-post every once in a while, helps with many projects and became co-author of several consensus-related studies the Skeptical Science team has published over the years. She also coordinates the moderation team for the online course “Denial101x – Making sense of climate science denial”.

<https://sks.to/BaerbelW>



John Cook  
George Mason University  
jcook20[at]gmu[dot]edu  
Fairfax Virginia U.S.A

John Cook is a research assistant professor at the Center for Climate Change Communication at George Mason University, researching cognitive science. In 2007, he founded Skeptical Science, a website which won the 2011 Australian Museum Eureka Prize for the Advancement of Climate Change Knowledge and 2016 Friend of the Planet Award from the National Center for Science Education. John co-authored the college textbooks *Climate Change: Examining the Facts* with Weber State University professor Daniel Bedford. He was also a coauthor of the textbook *Climate Change Science: A Modern Synthesis* and the book *Climate Change Denial: Heads in the Sand*. In 2013, he published a paper analyzing the scientific consensus on climate change that has been highlighted by President Obama and UK Prime Minister David Cameron. In 2015, he developed a Massive Open Online Course at the University of Queensland on climate science denial, that has received over 40,000 enrollments.

<https://communication.gmu.edu/people/jcook20>

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# LIST OF LINKS

## INTRODUCTION

Skeptical Science – <https://skepticalscience.com>

## JOHN COOK

Dissertation – [https://skepticalscience.com/docs/Cook\\_dissertation.pdf](https://skepticalscience.com/docs/Cook_dissertation.pdf)

4C – <https://www.climatechangecommunication.org/>

Guardian – <https://www.theguardian.com/environment/blog/2011/apr/28/climate-change-denial-skeptical-science>

## TEAM

Welcome page - <https://sks.to/welcome>

## HISTORY 1

2007 – <https://skepticalscience.com/A-look-back-SkS-in-2007.html>

2008 – <https://skepticalscience.com/A-look-back-SkS-in-2008.html>

2009 – <https://skepticalscience.com/A-look-back-SkS-in-2009.html>

2010 – <https://skepticalscience.com/A-look-back-SkS-in-2010.html>

2011 – <https://skepticalscience.com/A-look-back-SkS-in-2011.html>

2012 – <https://skepticalscience.com/A-look-back-SkS-in-2012.html>

2013 – <https://skepticalscience.com/A-look-back-SkS-in-2013.html>

## HISTORY 2

2014 – <https://skepticalscience.com/A-look-back-SkS-in-2014.html>

2015 – <https://sks.to/sks2015>

2016 – <https://sks.to/sks2016>

2017 – <https://sks.to/sks2017>

2018 – <https://sks.to/sks2018>

2019 – <https://sks.to/sks2019>

## REBUTTALS

Arguments – <https://skepticalscience.com/argument.php>

Fixed numbers – <https://skepticalscience.com/fixnum.php>

Taxonomy – <https://skepticalscience.com/argument.php?f=taxonomy>

## BLOG POSTS

Skeptical Science – <https://skepticalscience.com/newsarchives.php>

## CONSENSUS

Cook et al. 2013 – <https://iopscience.iop.org/article/10.1088/1748-9326/8/2/024024>

Consensus Homepage – <https://skepticalscience.com/tcp.php?t=home>

## CONSENSUS continued

Best ERL-paper 2013 – <https://skepticalscience.com/SkS-consensus-paper-ERL-best-article-2013.html>

97hours – <https://skepticalscience.com/nsh/>

Cook et al. 2016 – <https://sks.to/coc>

One Million downloads – <https://sks.to/tcp-one-million>

## TRANSLATIONS

All translations – <https://skepticalscience.com/translation.php>

Helping with translations – <https://sks.to/help-translate>

Debunking Handbook – <https://sks.to/debunk>

## DENIAL101X

MOOC on edX – <https://sks.to/Denial101x>

UQx Team – <https://itali.uq.edu.au/about/projects/uqx>

Wakelet Collection – <https://wakelet.com/@denial101x>

MOOC moderation – [https://skepticalscience.com/docs/Cook\\_2017\\_MOOC.pdf](https://skepticalscience.com/docs/Cook_2017_MOOC.pdf)

C.A.R.D.S. – Computer Assisted Recognition of Denial and Skepticism

4D project - <https://www.climatechangecommunication.org/the-4d-project-countering-misinformation/>

## RESOURCES

Graphics – <https://skepticalscience.com/graphics.php>

Interactive timeline – <https://skepticalscience.com/cshistory.php>

The Escalator – <https://skepticalscience.com/graphics.php?g=47>

## TOOLS

Temperature Tool – [https://skepticalscience.com/temperature\\_tool.html](https://skepticalscience.com/temperature_tool.html)

Glossary – <https://skepticalscience.com/glossary.php>

Heat Widget – <https://sks.to/heat>

## CHALLENGES

Conspiracy theories – <https://skepticalscience.com/Conspiracy-theories-Skeptical-Science.html>

Hack – <https://sks.to/hack>

## RECOGNITION

Eureka prize – [https://skepticalscience.com/Eureka\\_Prize\\_Winner\\_2011.html](https://skepticalscience.com/Eureka_Prize_Winner_2011.html)

NCSE – <https://ncse.com/>

Friends of the Planet – <https://ncse.com/news/2016/05/friend-darwin-friend-planet-awards-2016-0017058>

Endorsements – <https://skepticalscience.com/endorsements.shtml>

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