



# Persuading the majority – from experiences over the climate change debate

**John Cook**

7 October 2013

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Meeting the  
challenge of change

**gciQ**  
Global Change Institute

 THE UNIVERSITY  
OF QUEENSLAND  
AUSTRALIA



# Skeptical Science

Getting skeptical about global warming skepticism



- Home
- Arguments
- Software
- Resources
- Comments
- The Consensus Project
- Translations
- About
- Donate

## MOST USED Climate Myths

and what the science really says...

- Climate's changed before
- It's the sun
- It's not bad
- There is no consensus
- It's cooling
- Models are unreliable
- Temp record is unreliable
- Animals and plants can adapt
- It hasn't warmed since 1998
- 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 positives. |  |
| 4 | "There is no consensus"        |    | 97% of climate experts agree humans are causing global warming.                                     |  |
| 5 | "It's cooling"                 |    | The last decade 2000-2009 was the hottest on record.  |  |
| 6 | "Models are unreliable"        |    | Models successfully reproduce temperatures since 1900 globally, by land, in the air and the ocean.  |  |
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| 8 | "Animals and plants can adapt" |    | Global warming will cause mass extinctions of species that cannot adapt on short time scales.       |  |



The Consensus Project Website

Winner of the 2011

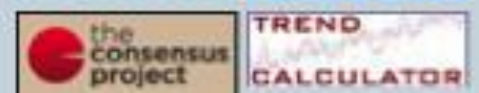


Eureka Prize  
Advancement of  
climate change  
knowledge

TEXTBOOK



### Climate Change Science: A Modern Introduction

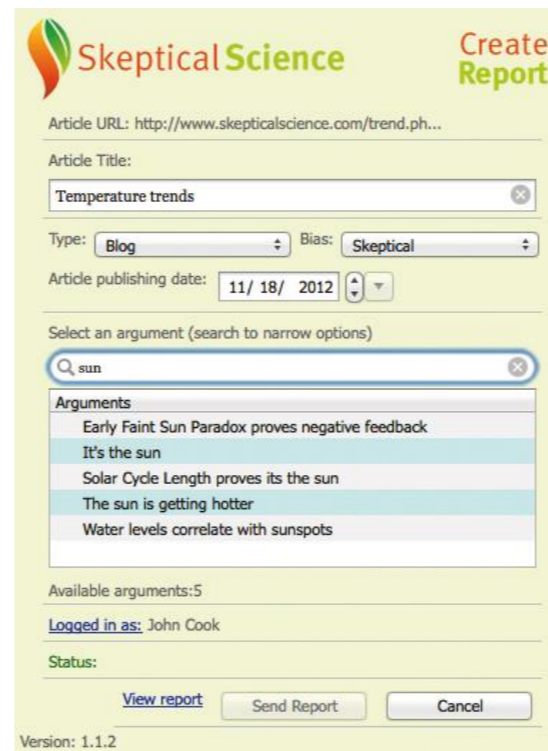


# Disseminating Climate Information

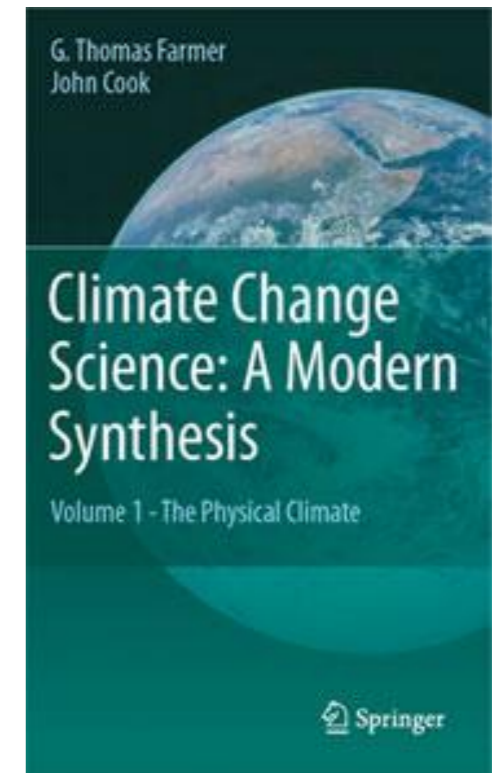
Smartphone apps



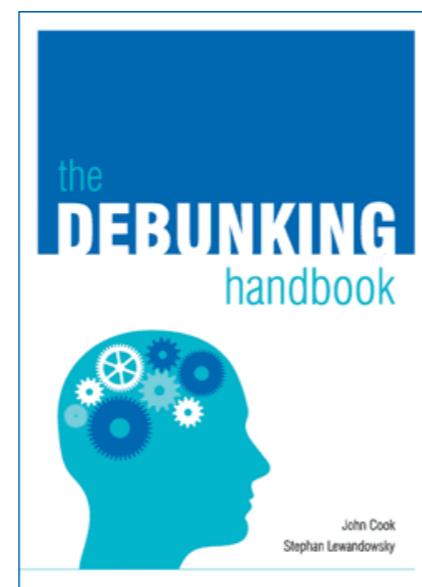
Browser Plug-in



Textbook



Booklets



Translations

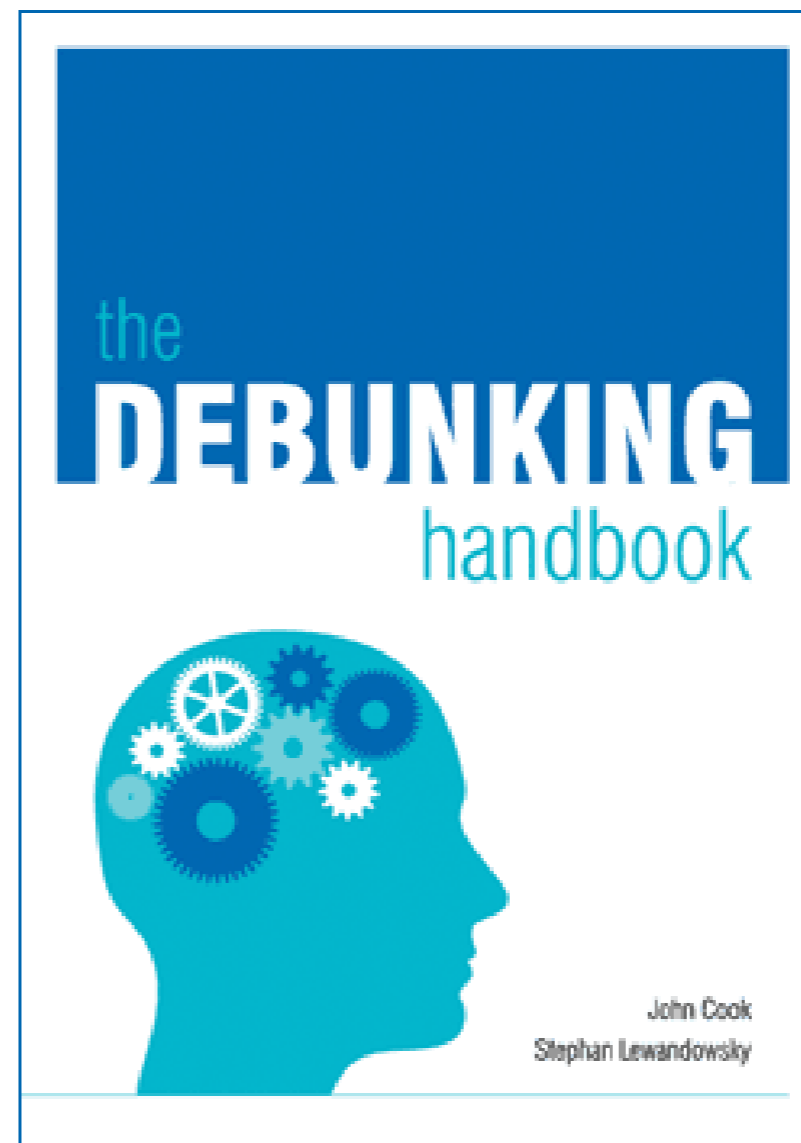




# Research into psychology of misinformation

<http://sks.to/pspi>

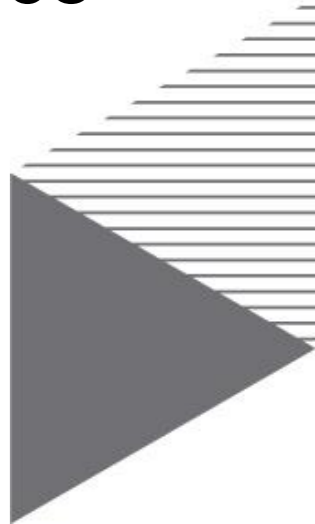
<http://sks.to/debunk>





## Today's topics

- ▶ What is the most effective way to debunk a myth?
- ▶ What are the most effective ways to deploy debunkings?
- ▶ Recommend a potentially effective way of reducing influence of renewable myths



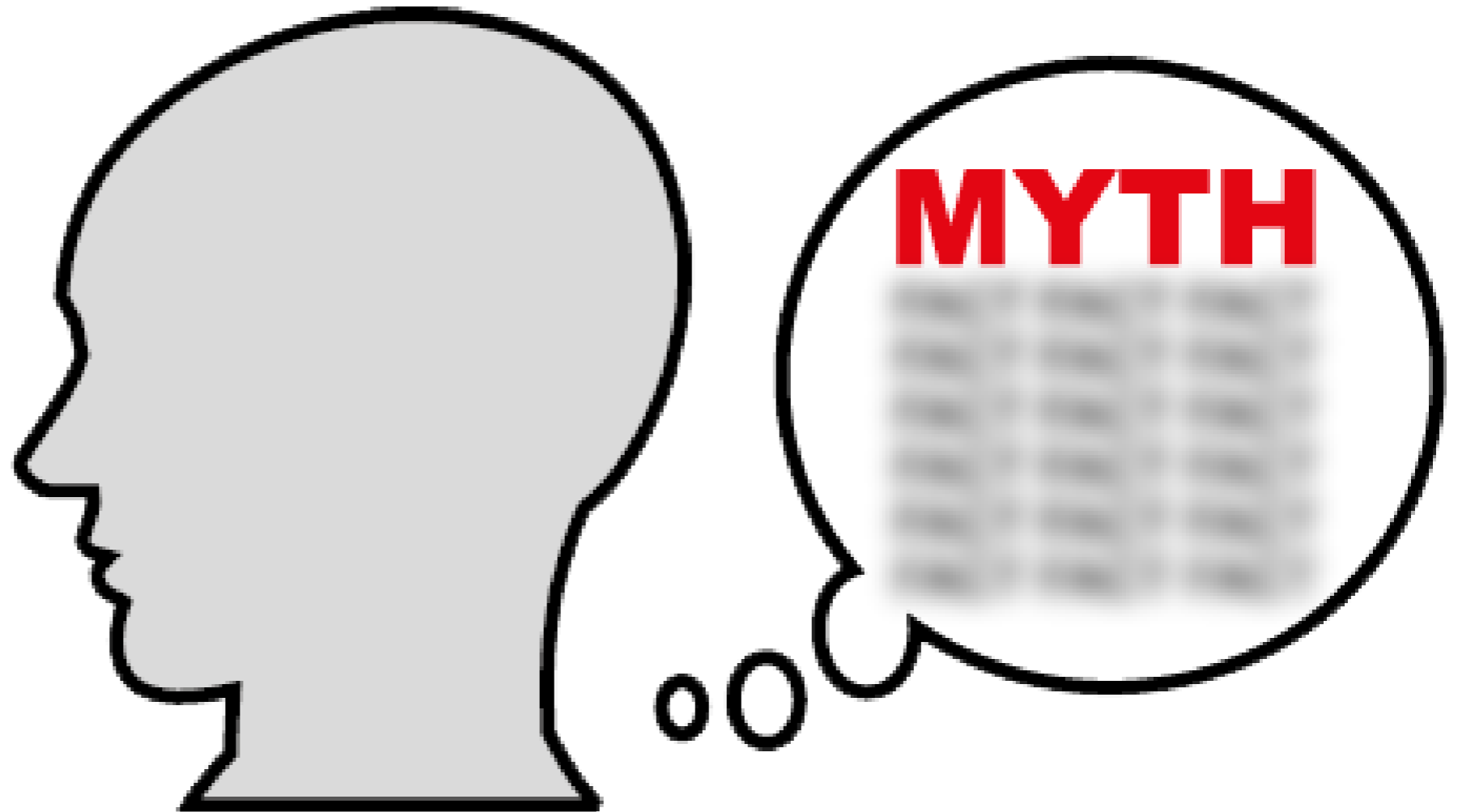
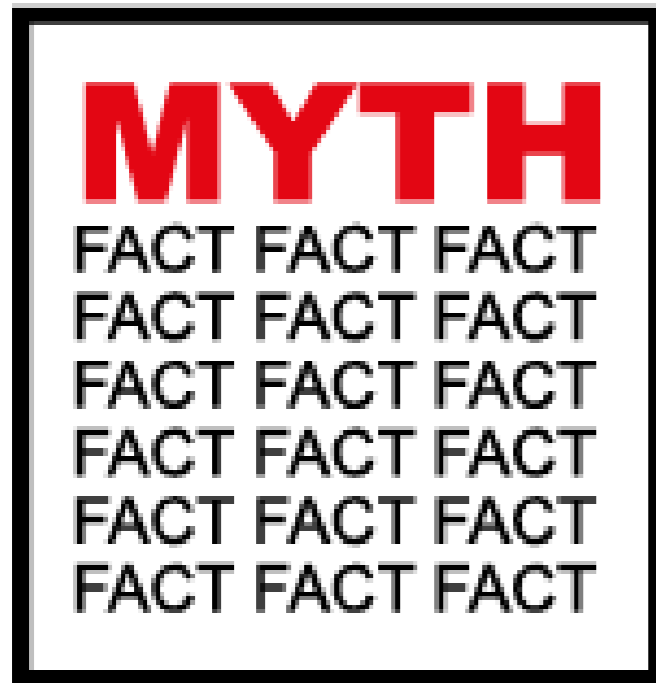
# One Model of the Human Brain



# A More Accurate Model of the Human Brain



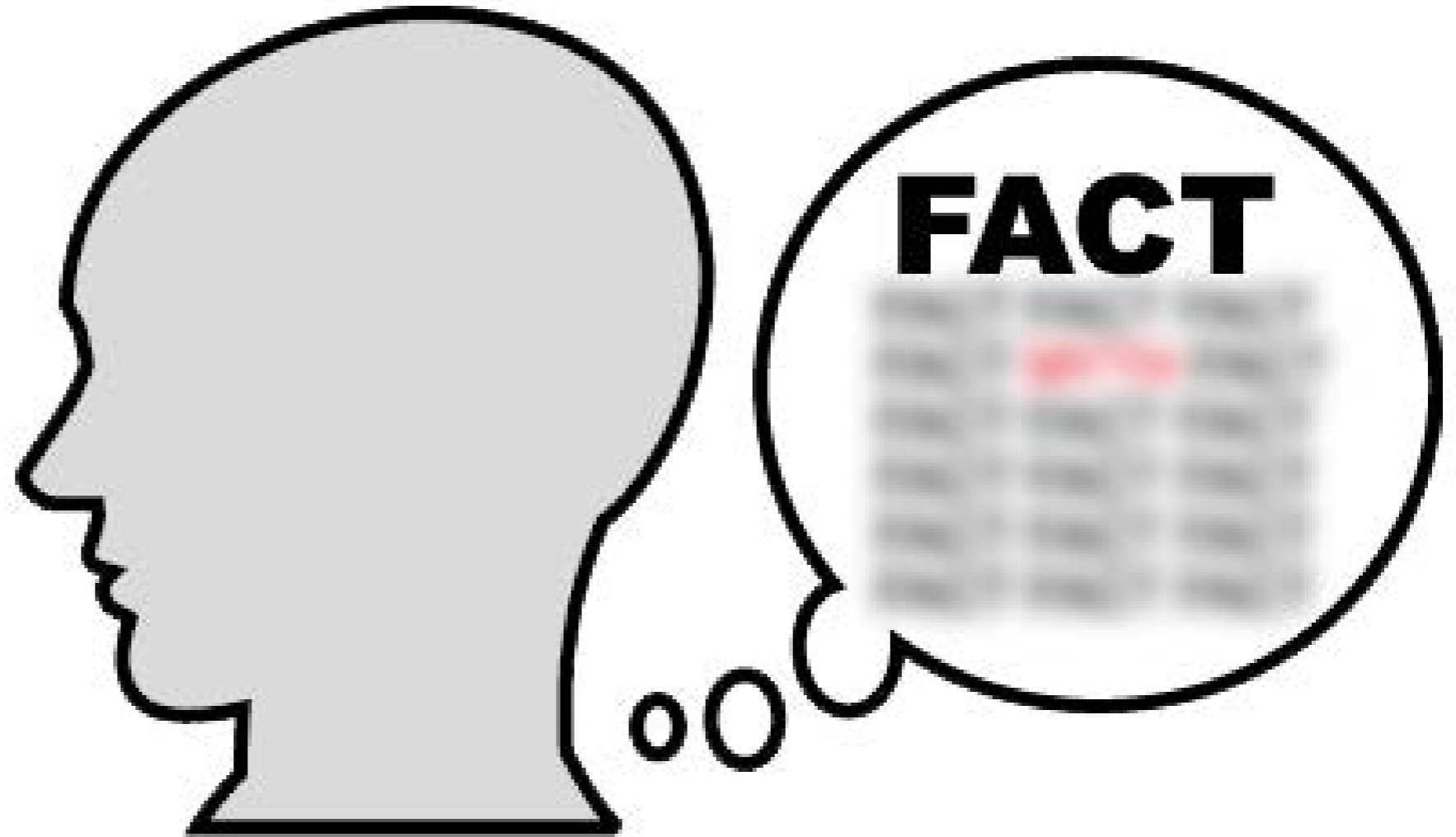
# The Familiarity Backfire Effect





# The Familiarity Backfire Effect

**FACT**  
FACT FACT FACT  
FACT **MYTH** FACT  
FACT FACT FACT  
FACT FACT FACT  
FACT FACT FACT  
FACT FACT FACT



A black and white photograph of a young boy looking at a large, cylindrical, mechanical robot. The robot has a complex, multi-tiered design with various mechanical components, including a large circular opening in the middle. The boy is wearing a dark sweater over a white turtleneck and dark pants. A speech bubble is overlaid on the image, containing the text: 

**Danger,  
Will Robinson!  
Approaching  
myth!**

# Sun & climate: moving in opposite directions

## What the science says...

[Link to this page](#)

Select a level...

● Basic

■ Intermediate

◆ Advanced

In the last 35 years of global warming, sun and climate have been going in opposite directions

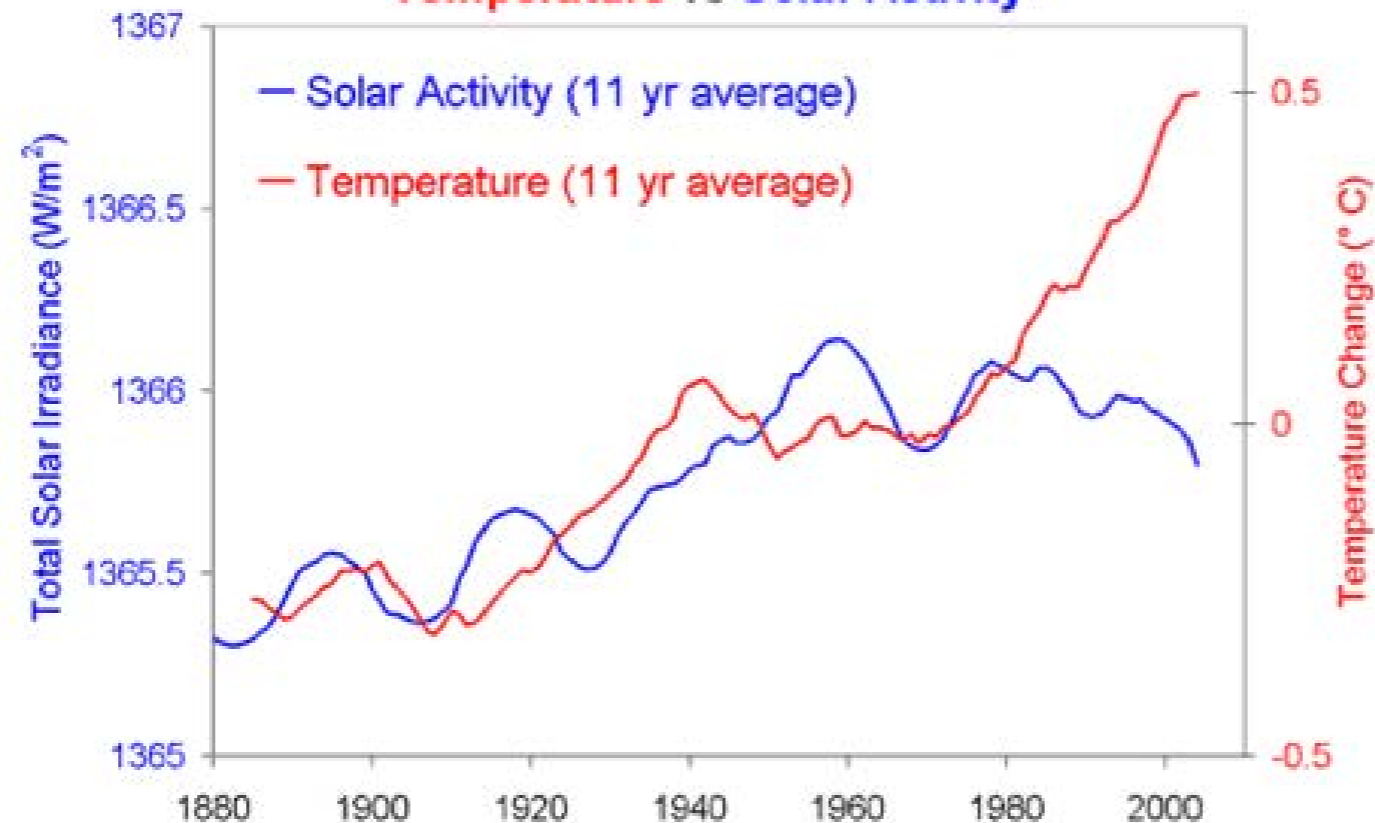
### Climate Myth...

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." (BBC)

Over the last 35 years the sun has shown a slight cooling trend. However global temperatures have been increasing. Since the sun and climate are going in opposite directions scientists conclude the sun cannot be the cause of recent global warming. The only way to blame the sun for the current rise in temperatures is by cherry picking the data. This is done by showing only past periods when sun and climate move together and ignoring the last few decades when the two are moving in opposite direction.

### Temperature vs Solar Activity












# The Overkill Backfire Effect



- A simple myth is more cognitively attractive than an over-complicated correction (Schwarz et al 2007)

# The Overkill Backfire Effect

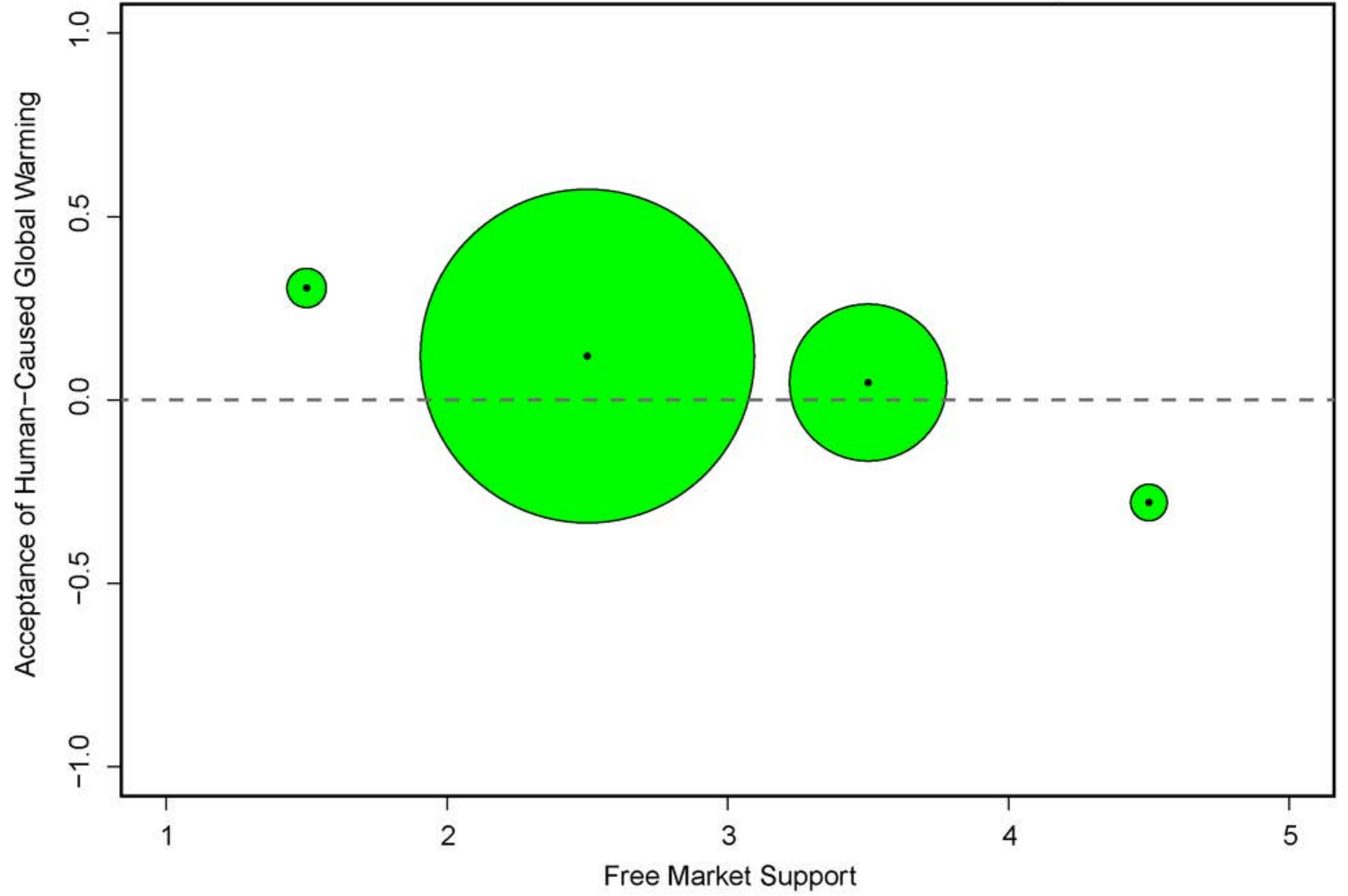


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| 9 | "It hasn't warmed since 1998"  |    | For global records, 2010 is the hottest year on record, tied with 2005.                             |  |

# The Worldview Backfire Effect

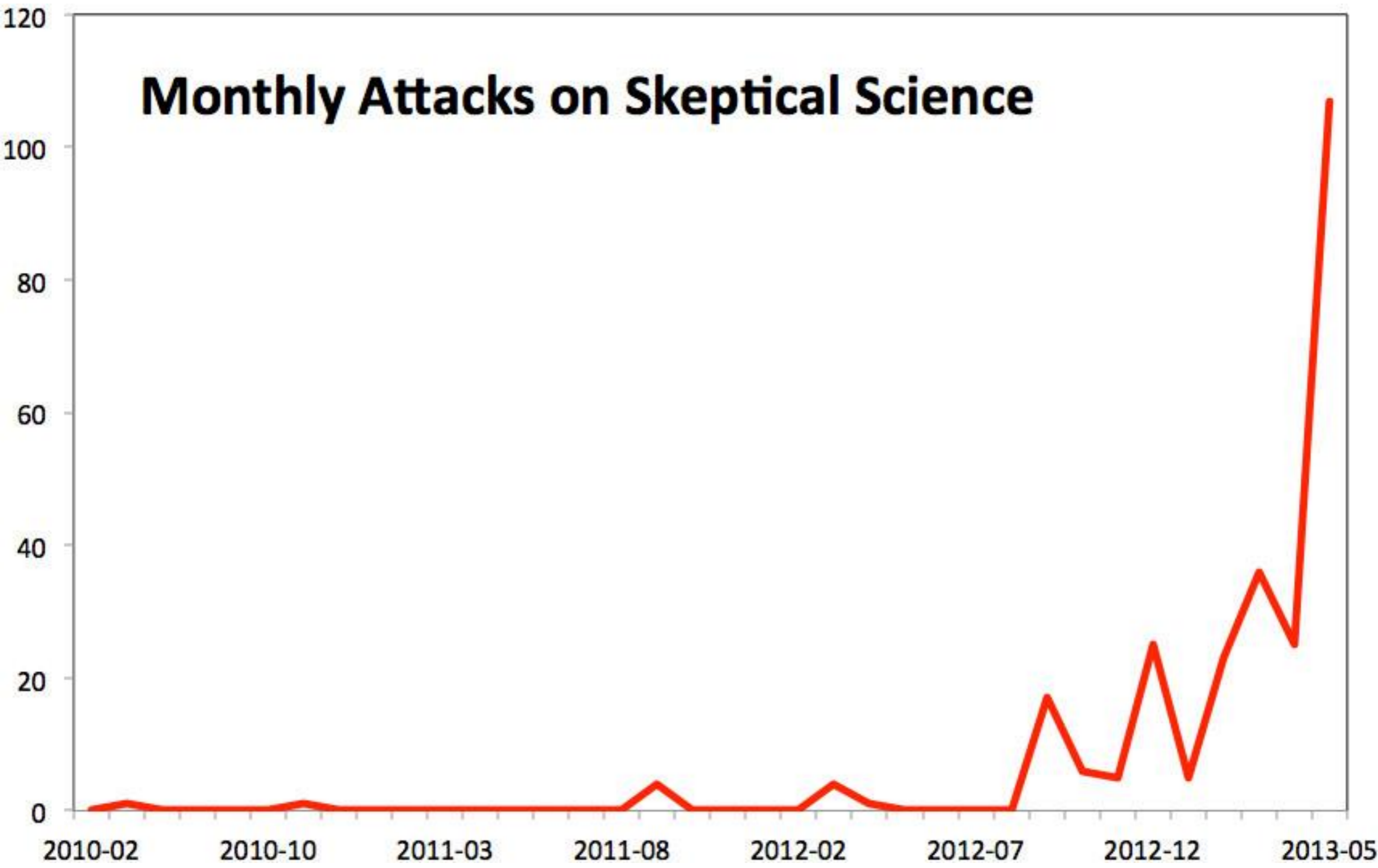


# Effect of Consensus Information on USA sample





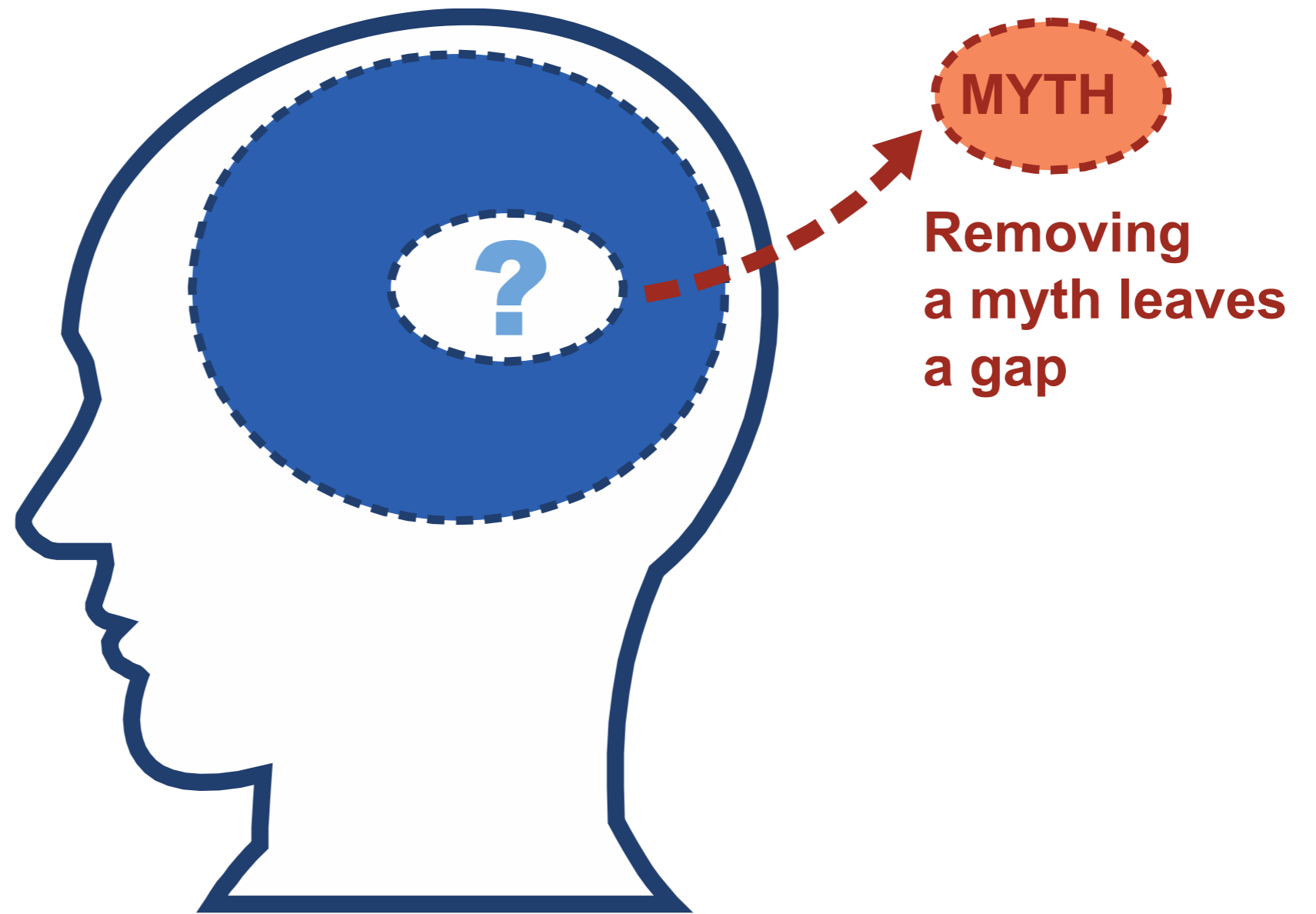
# Monthly Attacks on Skeptical Science



One last psychological pitfall

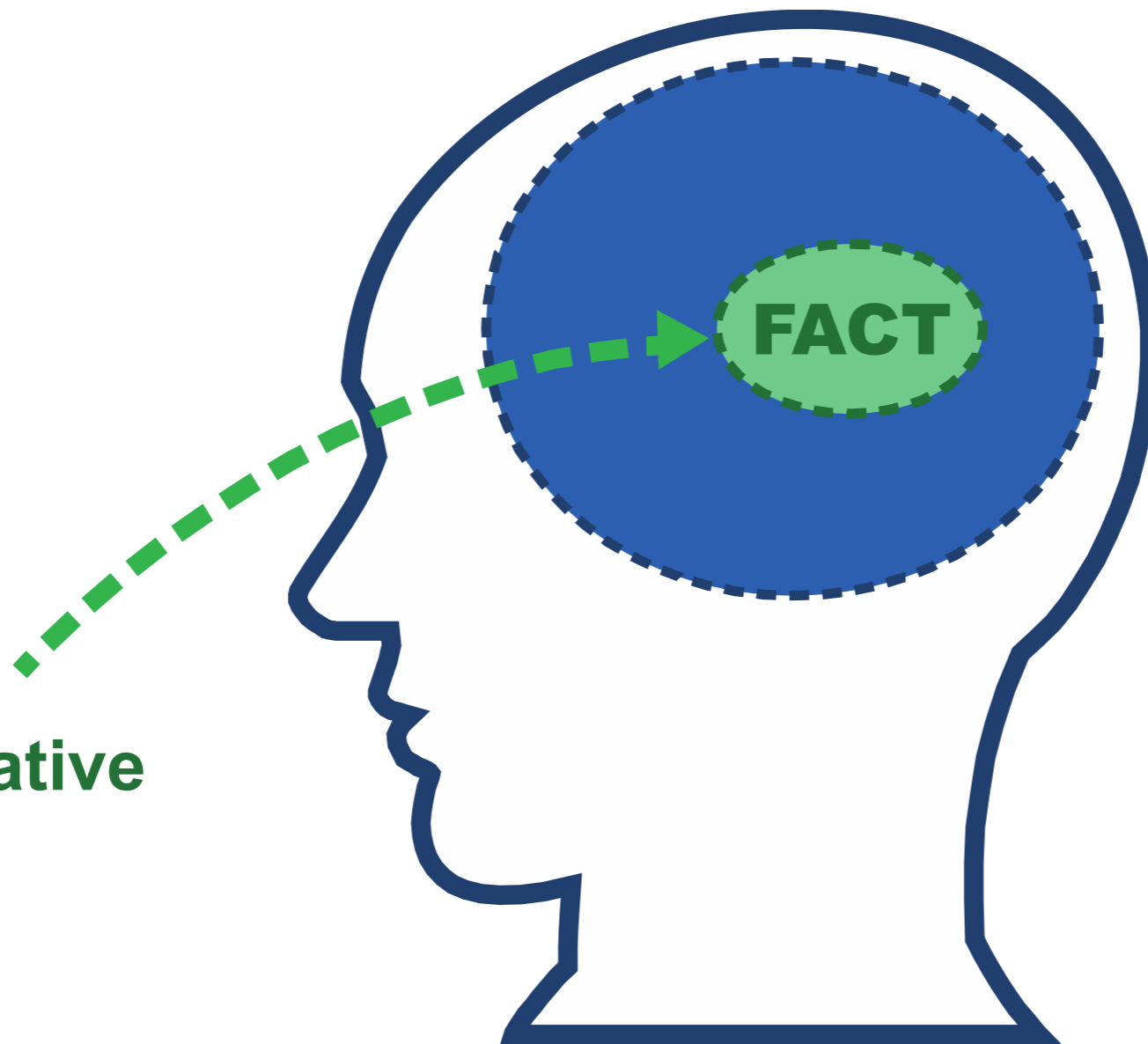


# Debunking Creates a Gap



# An Alternative Explanation

**Replace  
with alternative  
narrative**



# The Psychology of Misinformation

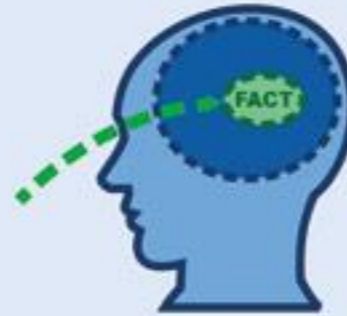
## PROBLEM

Continued Influence Effect

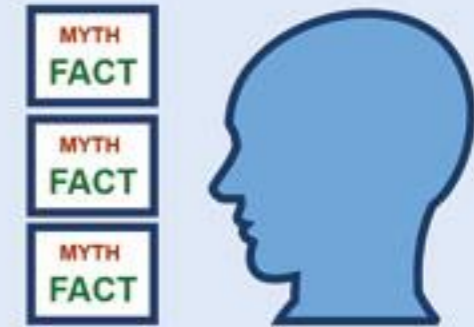


## SOLUTIONS

Alternative Account



Repeated Retraction



Familiarity Backfire Effect



Emphasis on Facts



Preexposure Warning



Overkill Backfire Effect



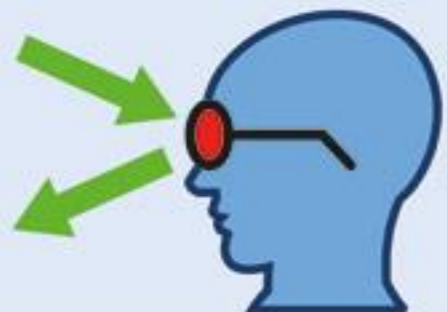
Simple, Brief Rebuttal



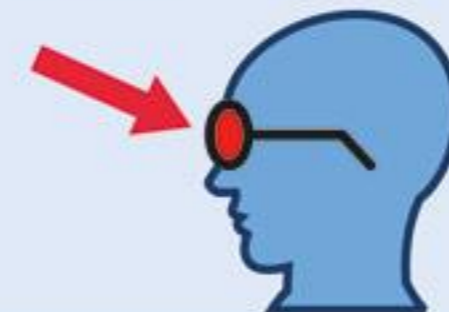
Foster Healthy Skepticism



Worldview Backfire Effect



Affirm Worldview



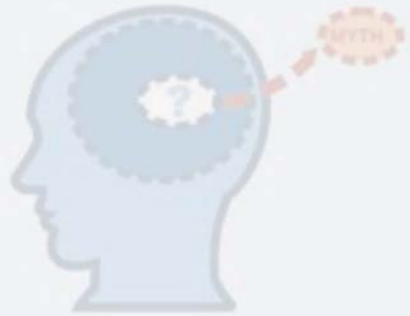
Affirm Identity



# The Psychology of Misinformation

## PROBLEM

Continued Influence Effect

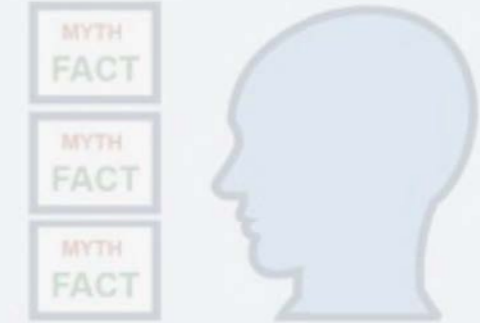


## SOLUTIONS

Alternative Account



Repeated Retraction



Familiarity Backfire Effect



Emphasis on Facts



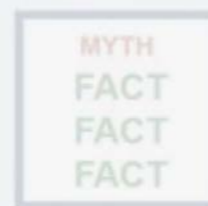
Preexposure Warning



Overkill Backfire Effect



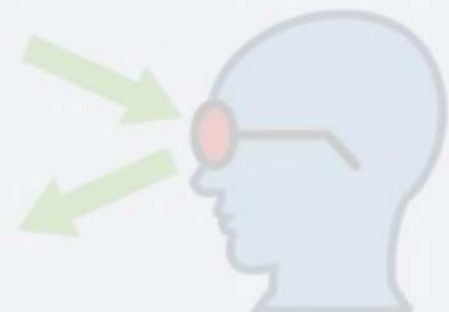
Emphasis on Facts



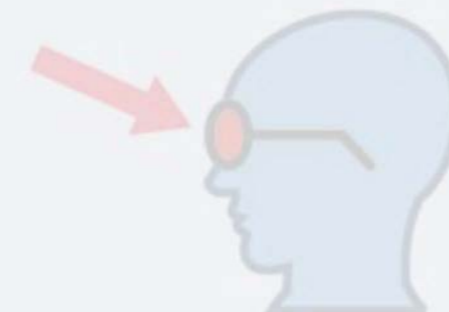
Preexposure Warning



Worldview Backfire Effect



Affirm Worldview



Affirm Identity

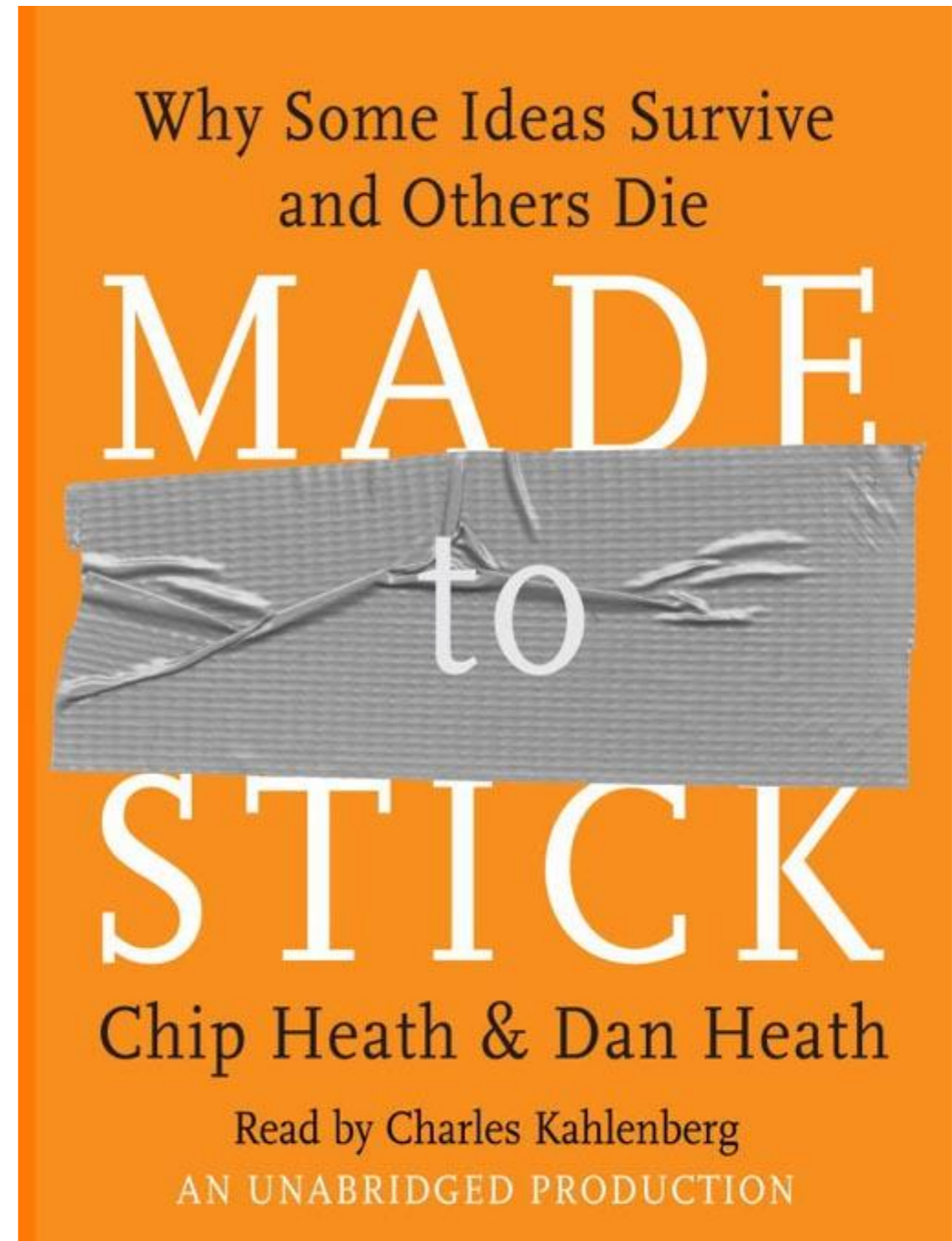


# Fight Sticky Ideas With Stickier Ideas

# Communicating “Sticky” Ideas

## **Sticky ideas are:**

- Simple
- Unexpected
- Concrete
- Credible
- Emotional
- Story



# Sticky Ideas vs Mathematics

## **Sticky ideas are:**

- Simple
- Unexpected
- Concrete
- Credible
- Emotional
- Story

## **Climate Science is:**

- Complicated
- Perplexing
- Abstract
- Attacked
- Detached
- Numbers



# Sticky Myth: Global Warming has “paused”

**Carbon tax on ice, climate science left to deal with pause in proceedings**

**World's top climate scientists told to 'cover up' the fact that the Earth's temperature hasn't risen for the last 15 years**

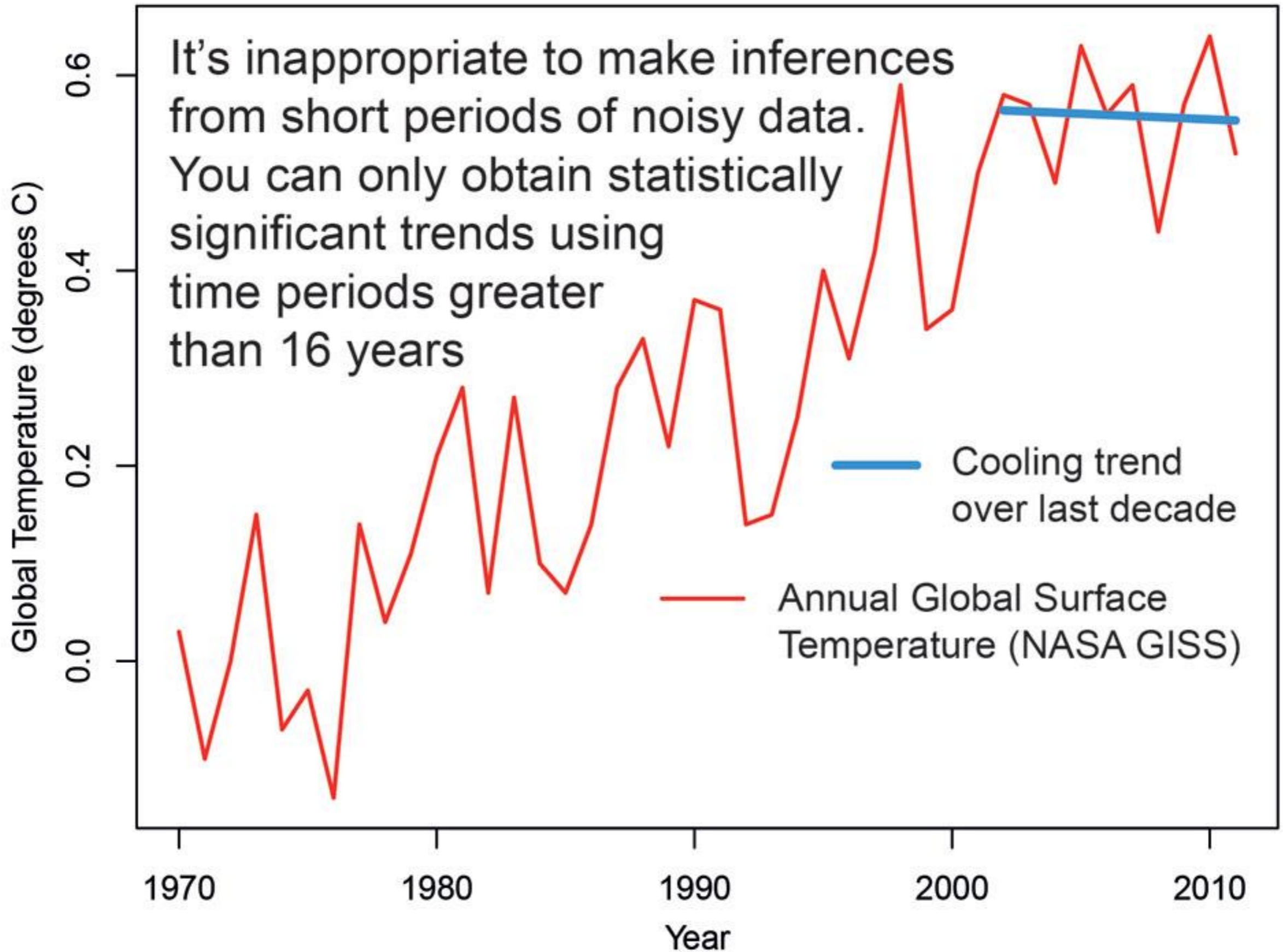
**Warming lull haunts authors of key climate report**

**Climate change experts under pressure to address slowdown in global warming**

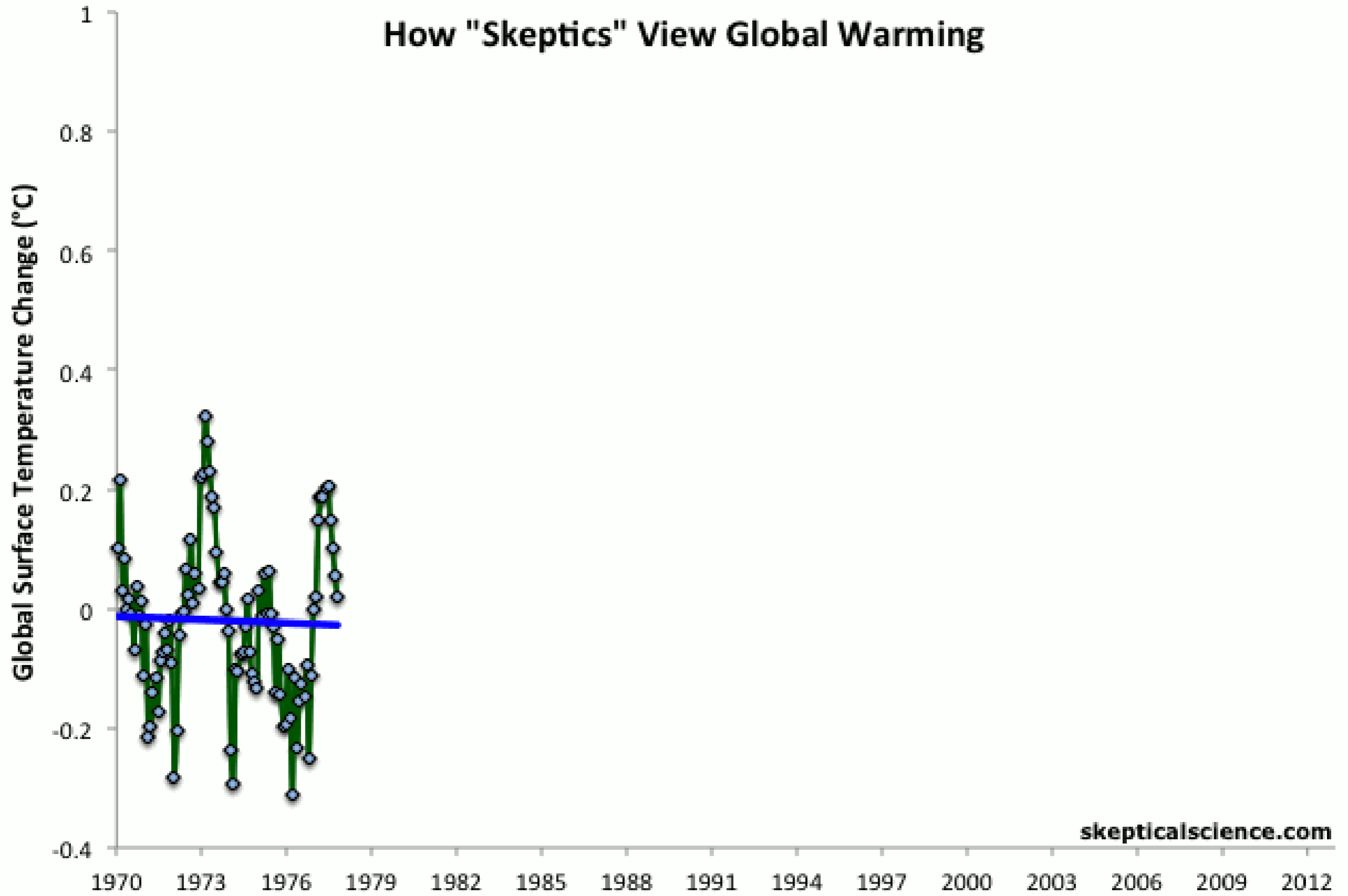
**Row over IPCC report as nations 'try to hide lack of climate change'**

**GWPF NOT IMPRESSED: IPCC FAILS TO COME CLEAN OVER GLOBAL TEMPERATURE STANDSTILL**

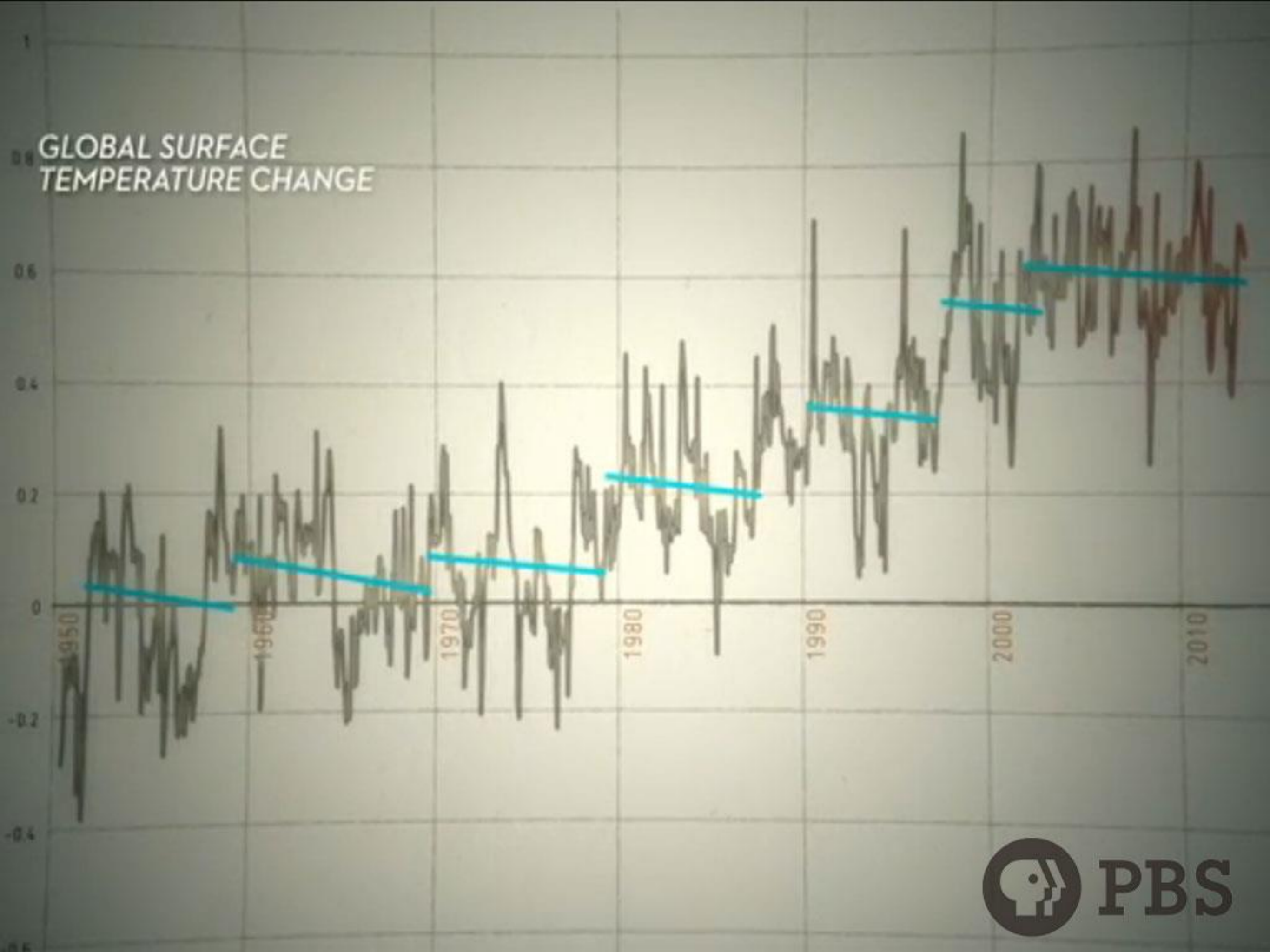
# Is global warming happening?

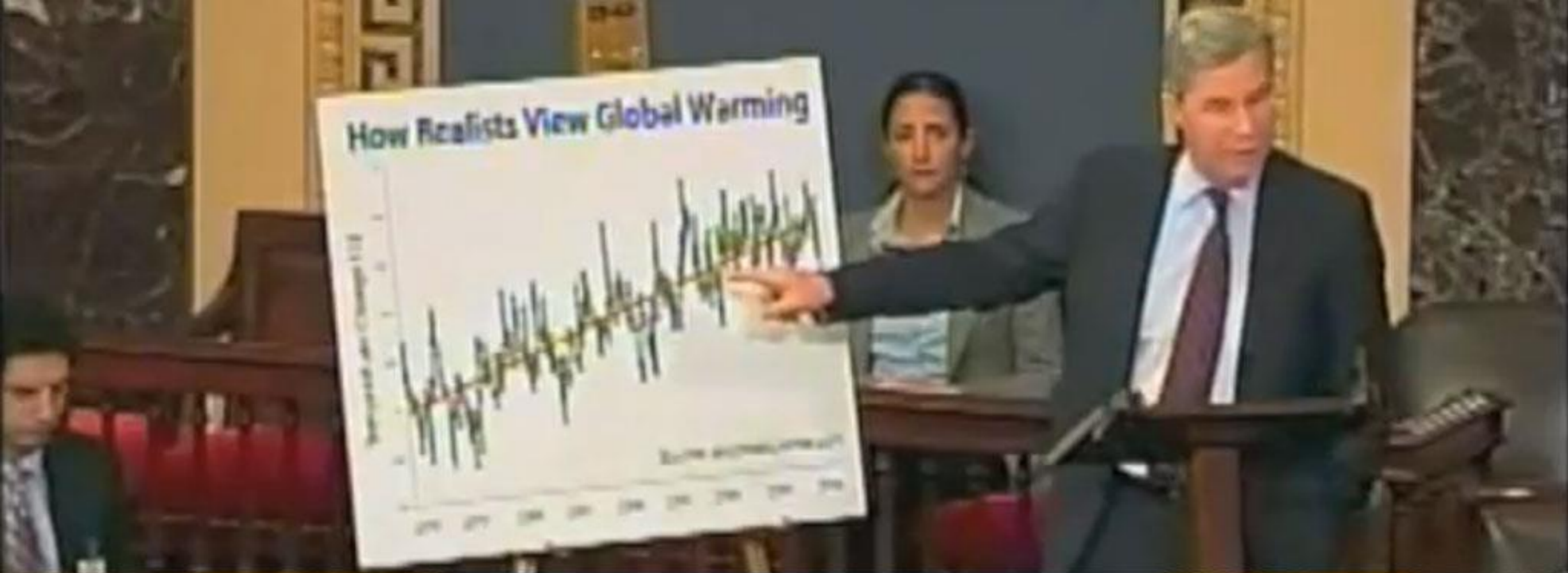


# How "Skeptics" View Global Warming



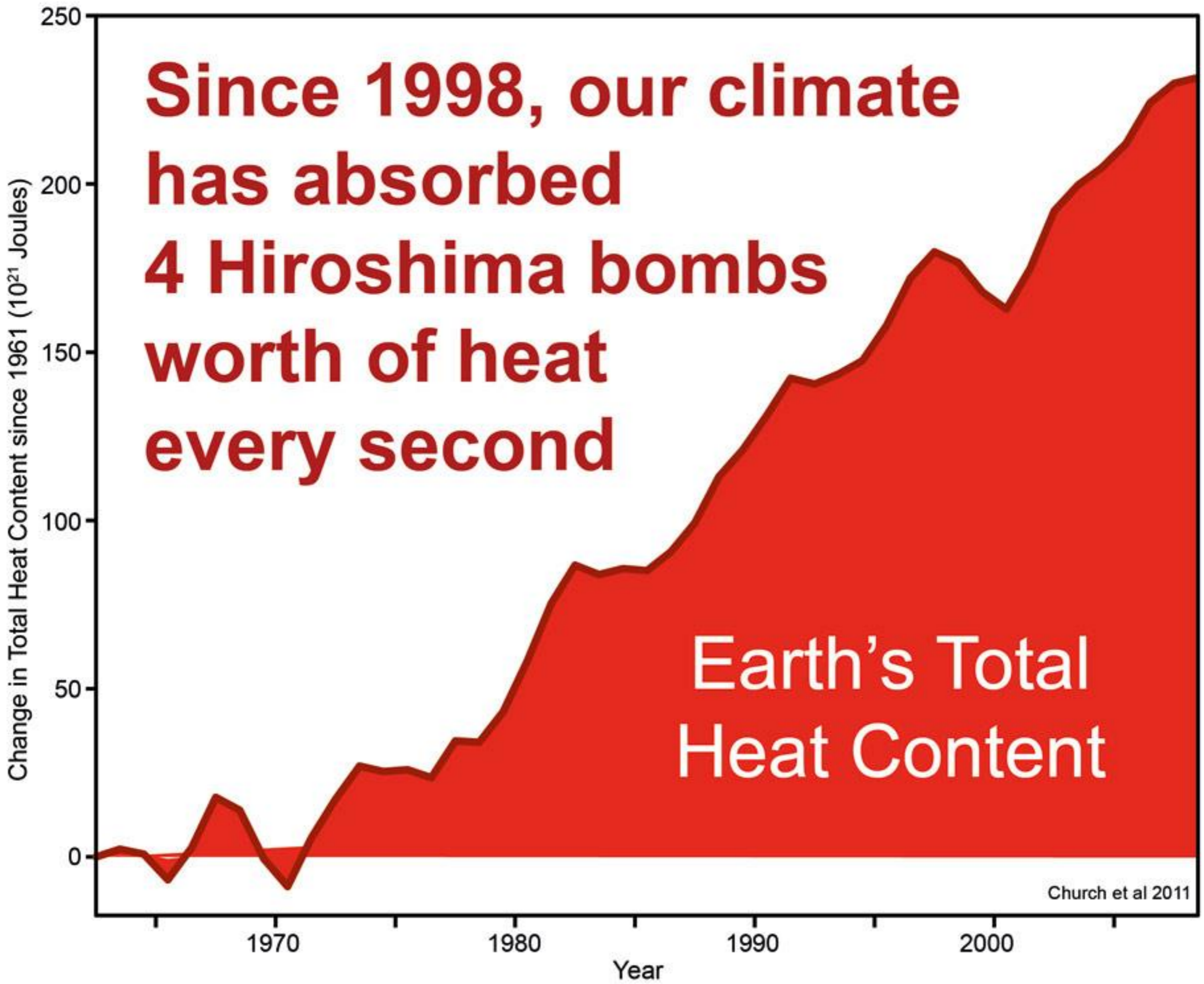
# GLOBAL SURFACE TEMPERATURE CHANGE





**Since 1998, our climate  
has absorbed  
4 Hiroshima bombs  
worth of heat  
every second**

**Earth's Total  
Heat Content**



Church et al 2011

 **THE  
AUSTRALIAN**

Climate change like atom bomb, Sydney summit told

**DECCAN  
Chronicle**

Earth's temperature rise equals four  
Hiroshima atomic bombs: Climate scientist

india.com

**dna**

Earth's temperature rise 'equal to four  
Hiroshima atomic bombs every second'

THE HINDU  
**Business Line**

'Earth's temperature rise equals four  
Hiroshima atomic bombs'

 **THE FINANCIAL EXPRESS**

Heat build up on Earth now equals  
four Hiroshima nuclear bombs

**समय**  **LIVE**

Earth building up temperatures

**The Canberra Times**

Climate change likened  
to heat of bomb blasts

 **Manager.ro**  
Portalul tău de știri

Schimbarile climatice, legate  
de bombele nucleare

 **9NEWS**

Climate change like atom  
bomb: scientists



# Key Lesson from Skeptical Science

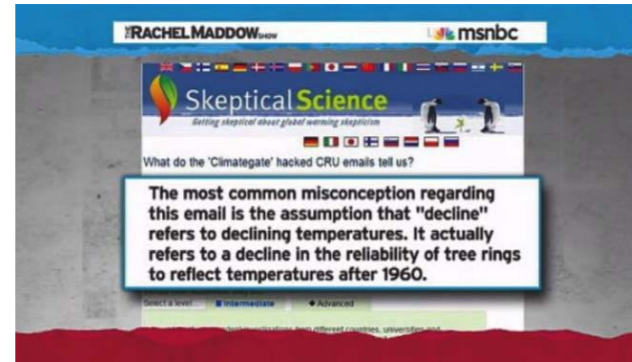
- ▶ Greatest impact comes from content republishers





# Impact of Skeptical Science Content

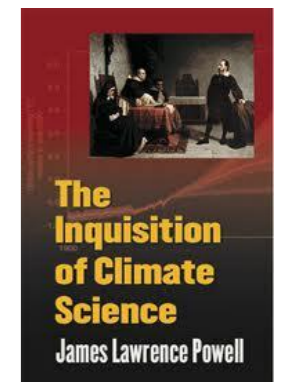
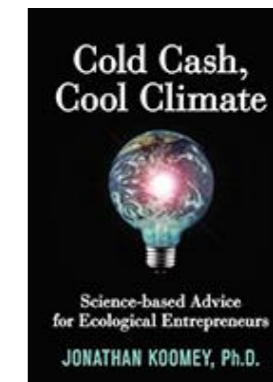
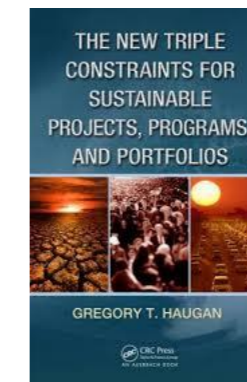
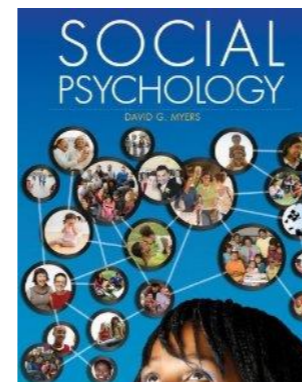
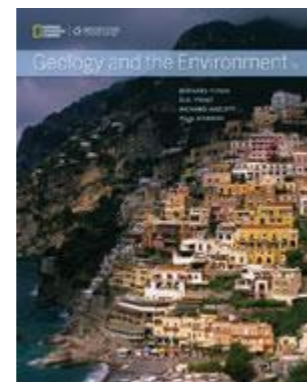
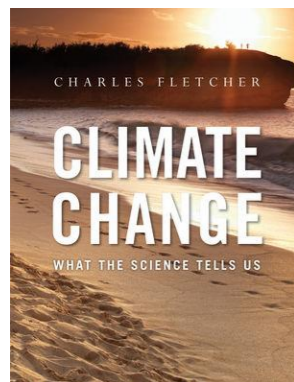
## Television



## University Curriculum

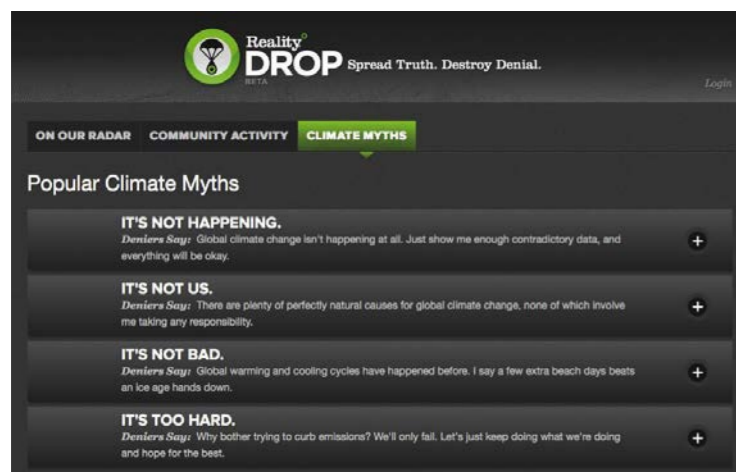


## University Textbooks

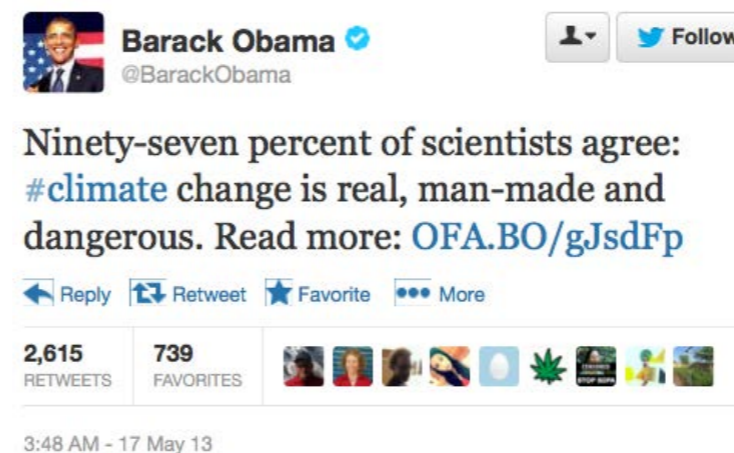


## Books

## Al Gore's Reality Drop



## President Obama














## Key Lesson from Skeptical Science

- ▶ Greatest impact comes from content republishers
- ▶ Publish content that is easily shared:



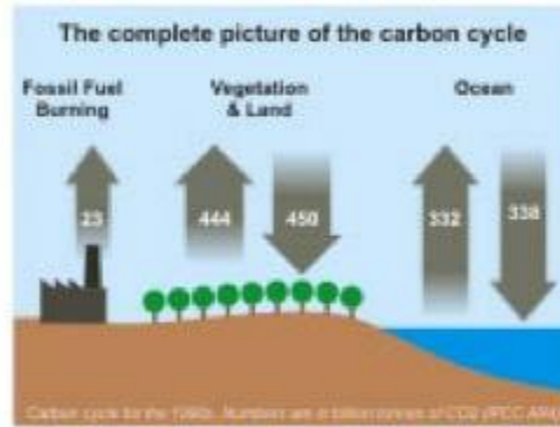
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# Climate Graphics by Skeptical Science

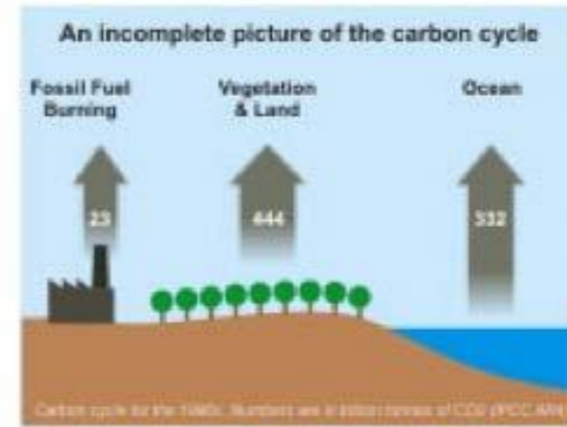
97 out of 100 climate experts think humans are changing global temperature



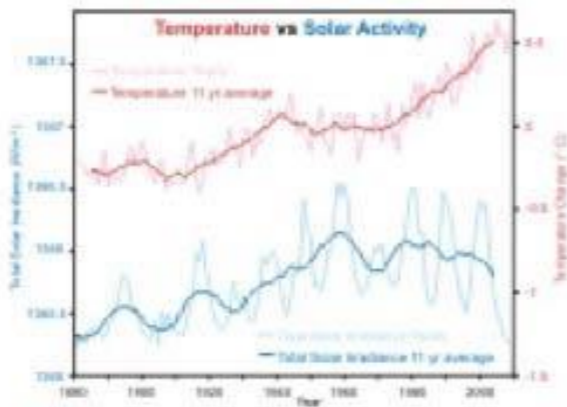
Scientific Consensus on Global Warming



Complete Carbon Cycle



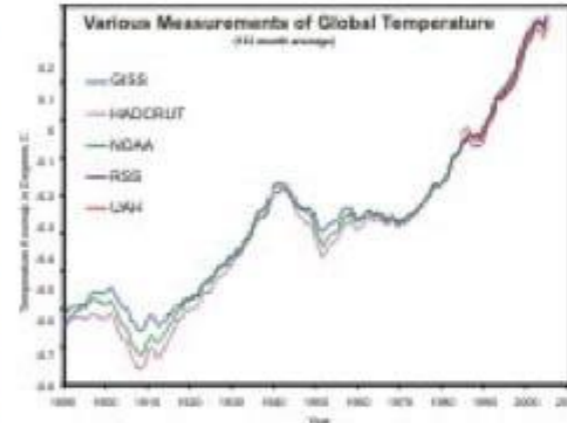
Incomplete Carbon Cycle



Solar vs Temperature



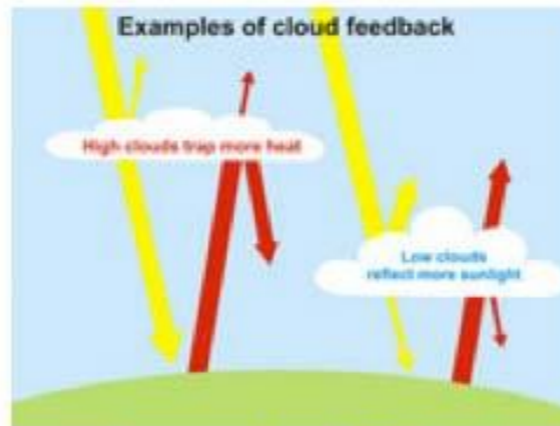
Waste heat vs Greenhouse warming



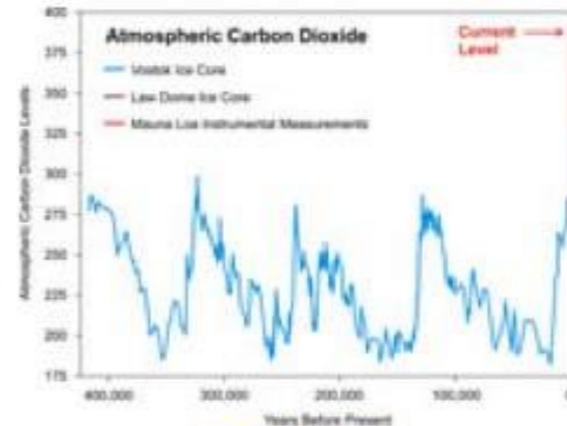
Temperature Composite



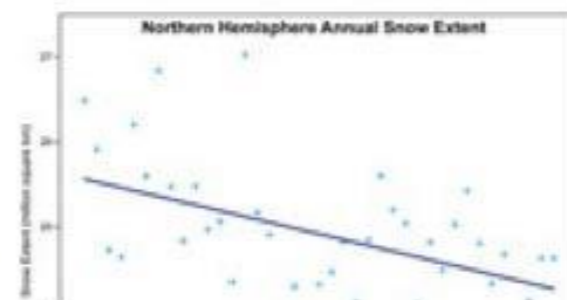
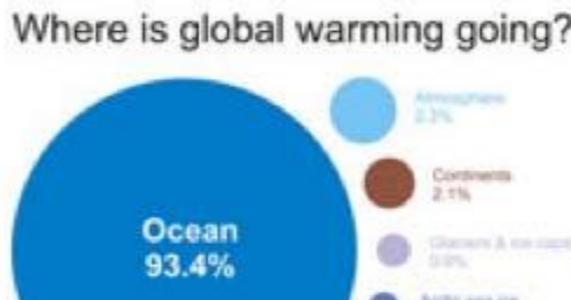
Warming Indicators



Examples of Cloud Feedback



CO2 History



# Sun & climate: moving in opposite directions

## What the science says...

[Link to this page](#)

Select a level...

● Basic

■ Intermediate

◆ Advanced

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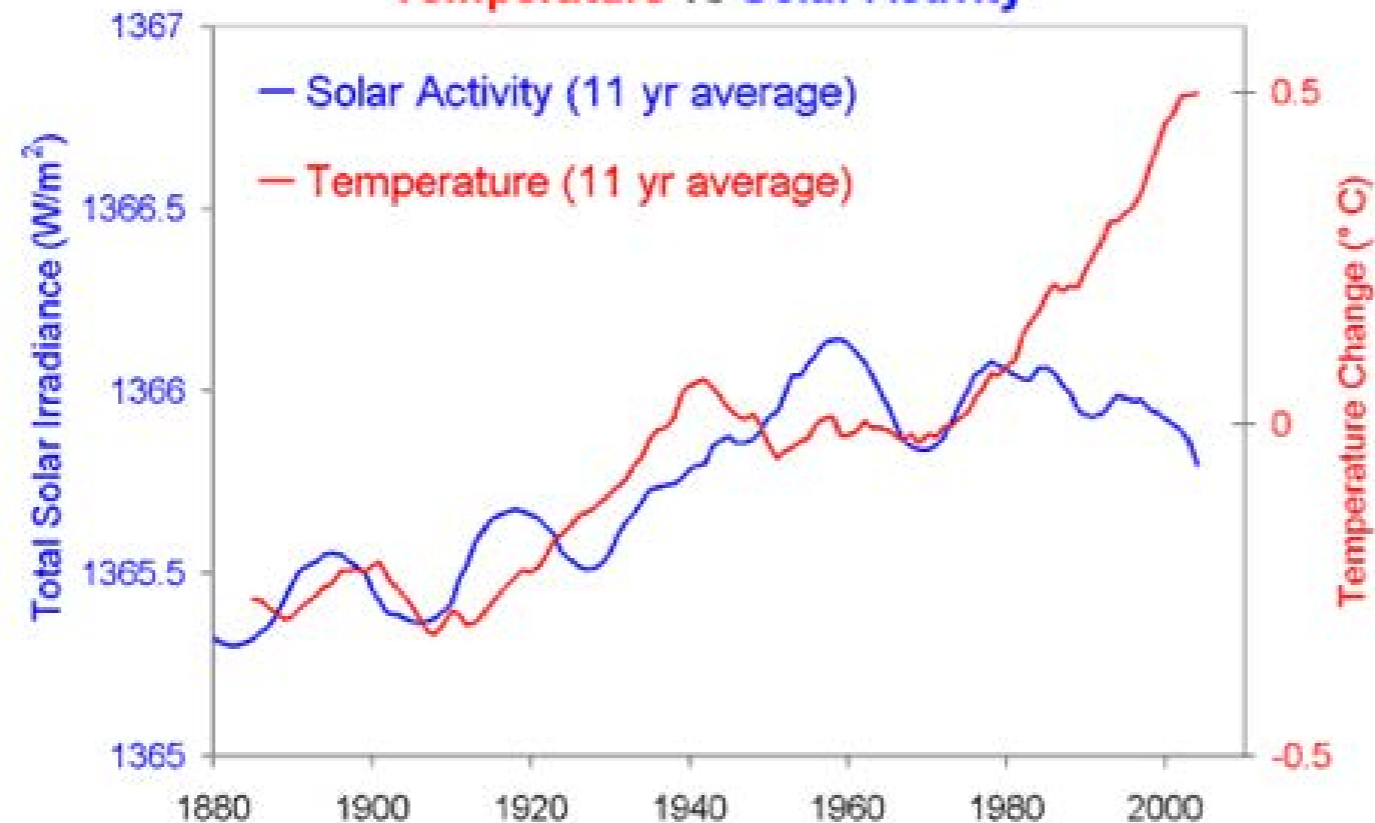
### Climate Myth...

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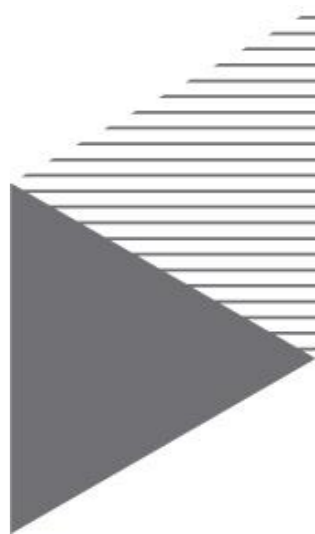
### Temperature vs Solar Activity





## Key Lesson from Skeptical Science

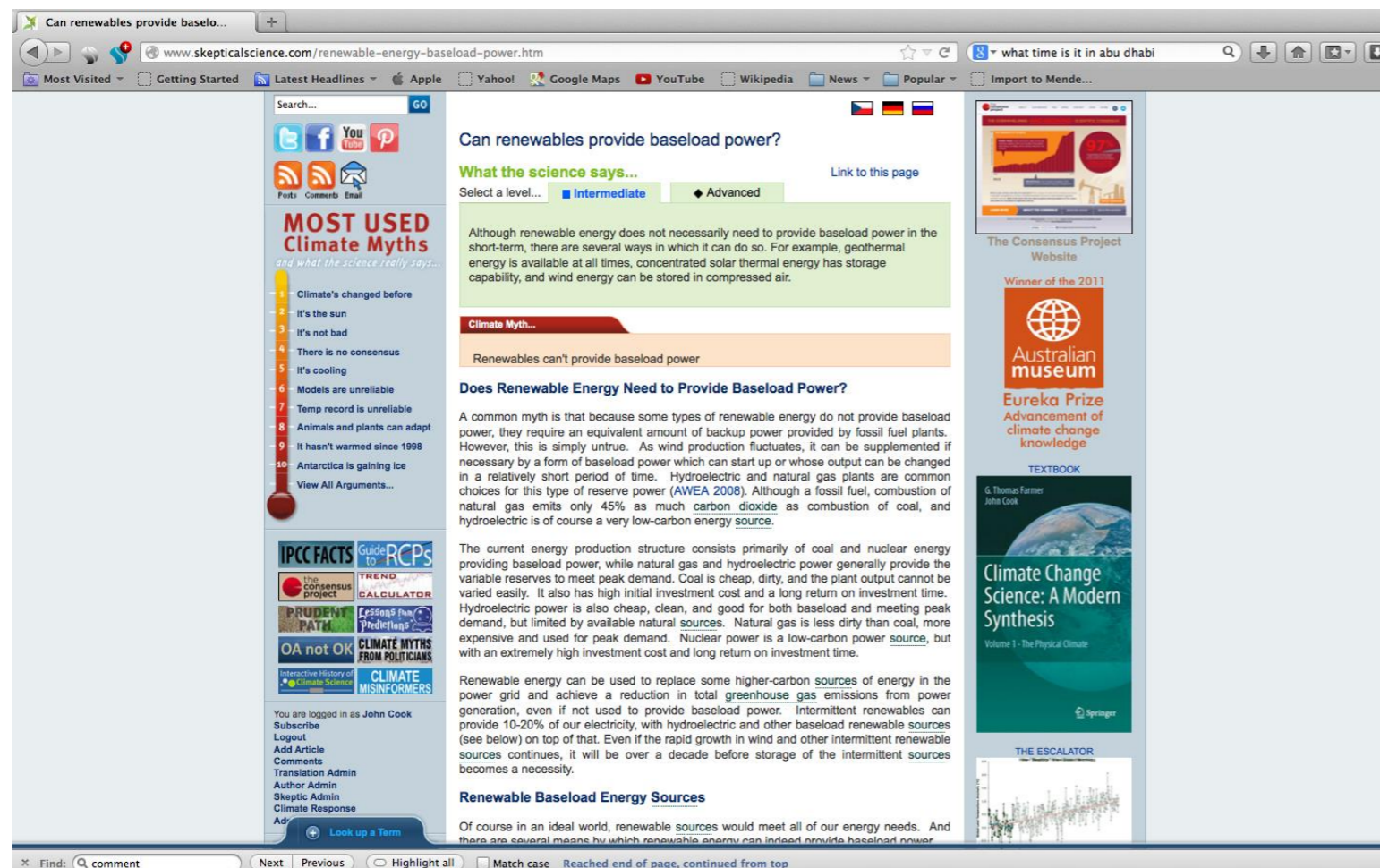
- ▶ Greatest impact comes from content republishers
- ▶ Publish content that is easily shared:
  - ▶ Tweetable one-line debunkings of each myth
  - ▶ Shareable infographics
  - ▶ Multi-level rebuttals
- ▶ Responsive: up-to-date and quick to respond



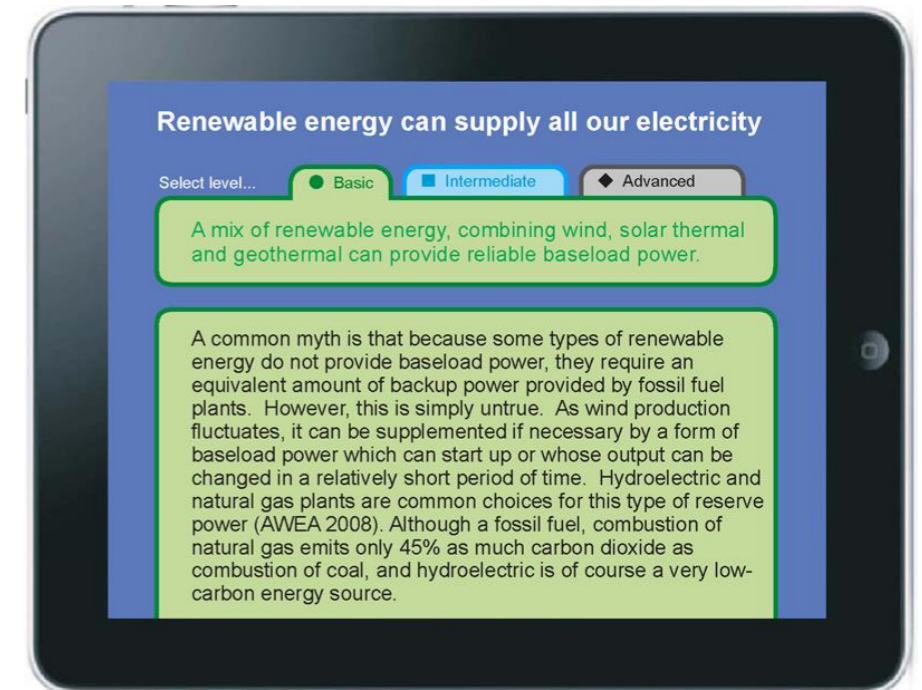
# Recommended Resource for Effective Debunking

- ▶ Easily accessible and shareable

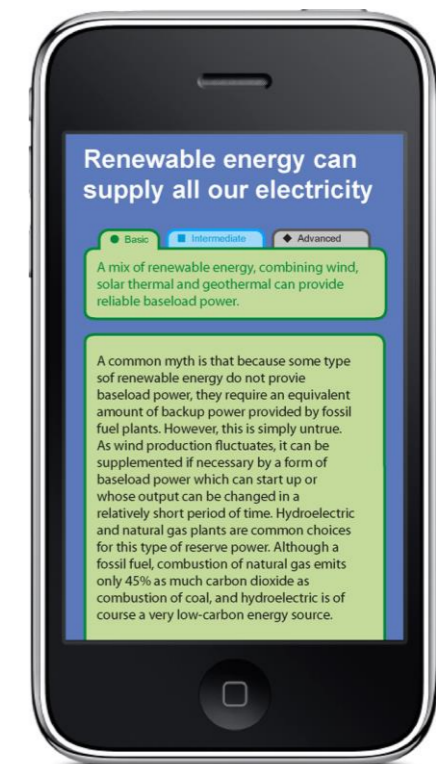
## Website



## Tablet



## Smartphone



# The Scientific Consensus on Climate Change

Select level...

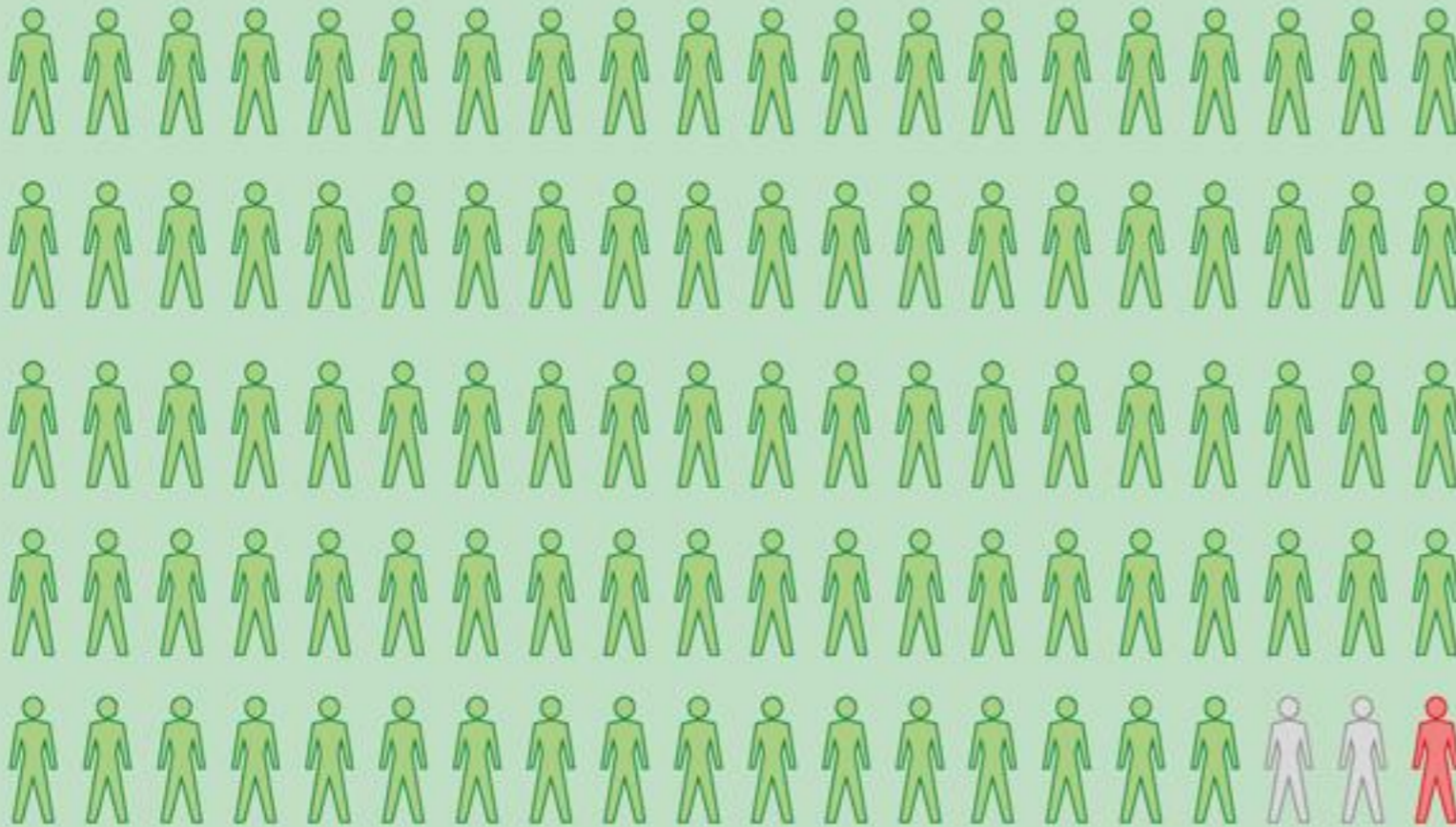
● Basic

■ Intermediate

◆ Advanced

97 out of 100 climate experts agree humans are causing global warming.

Several independent studies find 97% of climate scientists who are actively publishing peer-reviewed climate research agree that humans are causing global warming.



On top of this overwhelming consensus, National Academies of Science from 80 countries also endorse the consensus view of human-caused global warming.

For example, the "Global Warming Petition Project" claims 31,000 scientists disagree with the scientific consensus on global warming.

However, 99.9% of the scientists listed in the Petition Project are not climate scientists. The petition is open to anyone with a Bachelor of Science and includes medical doctors, mechanical engineers and computer scientists.

← MULTIPLE LEVELS

← TWEETABLE ONE-LINERS

← SHAREABLE INFOGRAPHICS

← MYTH

FACTUAL WRAPPER

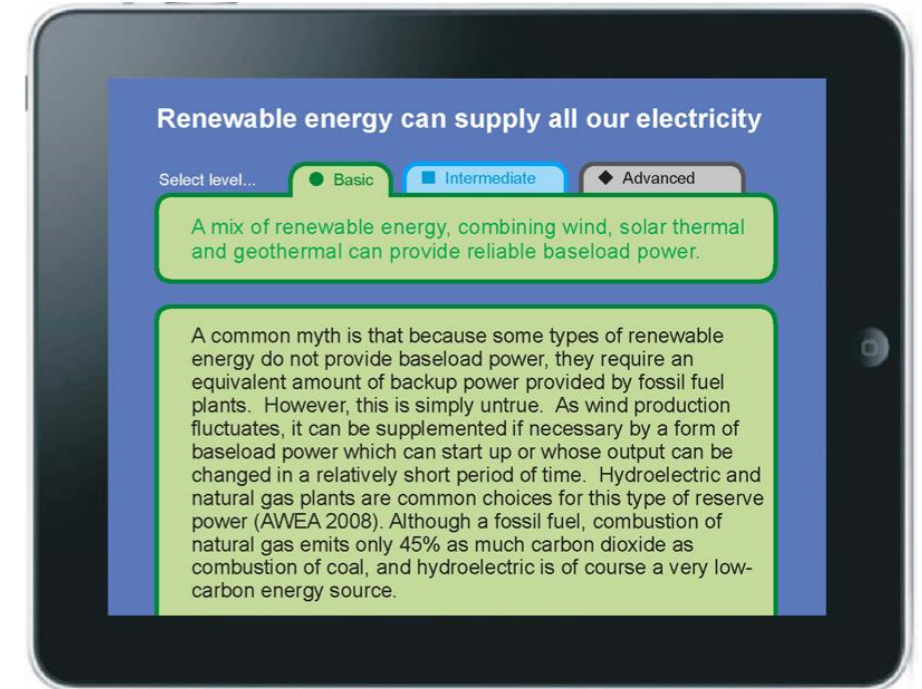
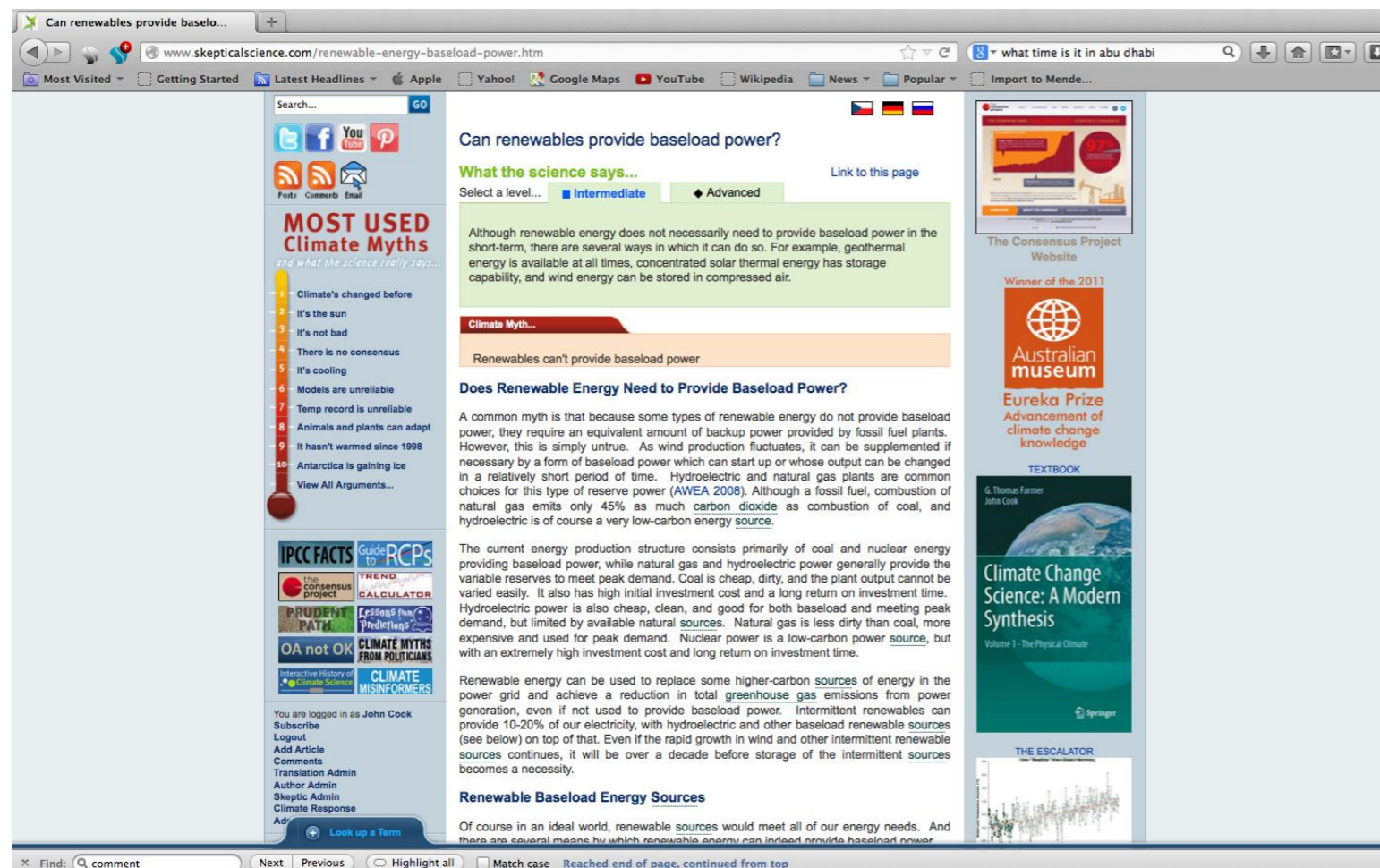


# Recommended Resource for Effective Debunking

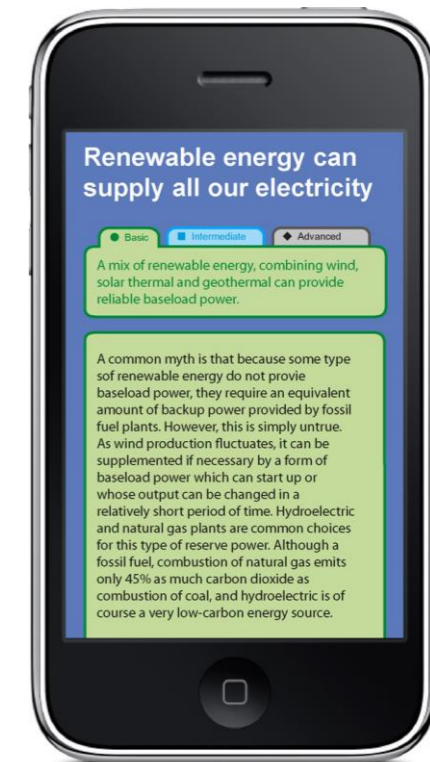
Tablet

► Website/iPad app/iPhone app proposal

Website



Smartphone





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