Class 23: Climate Denial

• An overview of denial tactics
• 10 popular denialist claims
• Organized climate denial

Learning Objectives

• Be able to debunk on the basis of science you have learned in this class at least two of the most often repeated denialist claims
• Explain the influence that media can have on opinions/understanding of climate change
• Identify and explain one purposeful disinformation campaign targeted at climate change science

“Poor Jim. He was a climate change denier and refused to see his iceberg melt.”

GEOLOGY 095, 195. Climate: past, present, future
Boris Johnson urged to challenge Trump on climate denial

350 experts call on PM to address president’s ‘dangerous’ and ‘irresponsible’ claims

“We urge you to challenge President Trump about his irresponsible approach to climate change, and seek to persuade him to take strong domestic action to reduce greenhouse gas emissions and to join coordinated international action including the Paris agreement,” they wrote.

The UK is due to host the a major UN climate summit next year – a meeting which is absolutely vital to international efforts to avoid dangerous climate change.

Boris Johnson is being urged by 350 leading climate researchers to robustly challenge Donald Trump on his “dangerous” and “irresponsible” denial of the risks of climate change during the US president’s visit to the UK this week.
Analyzing Climate Denialism

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Common Fallacies

**Fake Experts**
Promoting dissenting non-experts as highly qualified while not having published any actual climate research and/or received any relevant education.

**Logical Fallacies**
Logically flawed arguments that lead to false conclusions. Common logical fallacies are red herrings, non sequiturs, and false dichotomies.

**Impossible Expectations**
Demanding unrealistic standards of certainty before acting on the science. A technique practised by the tobacco industry.

**Cherry Picking**
Selectively choosing data that supports a desired conclusion that differs from the conclusion arising from all the available data.

**Conspiracy Theories**
Proposing a secret plan among a number of people, generally to implement a nefarious scheme such as conspiring to hide a truth or perpetuate misinformation. Climate deniers are more likely to be conspiracy theorists.
Critical to examine the logic behind denialist approaches.

**MYTH**
"Climate has always changed."

- **Premise 1** Climate changed naturally in the past.
- **Premise 2** Climate is changing now.

**Conclusion** Current climate change is natural.

**Jumping to Conclusions:** Just because nature caused climate change in the past doesn’t mean it has to be the cause now.
Climate denial contradictions

<table>
<thead>
<tr>
<th>Trend denial</th>
<th>Attribution denial</th>
<th>Impacts denial</th>
<th>Solutions denial</th>
<th>Science denial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snowfall disproves global warming.</td>
<td>Greenhouse effect has been falsified.</td>
<td>Water vapour is the most powerful greenhouse gas.</td>
<td>CO₂ is plant food.</td>
<td>Global warming is a socialist plot.</td>
</tr>
<tr>
<td>Extreme events cannot be attributed to global warming.</td>
<td></td>
<td></td>
<td></td>
<td>The Nazis invented global warming.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CO₂ is just a minuscule trace gas that has no effect.</td>
<td></td>
<td>Temperature record says it's cooling.</td>
</tr>
</tbody>
</table>
Among climate scientists, there is no doubt, climate change is real and a problem...among politicians...well a different story. The less you know, the less you worry. The more you know.
Climate denial is over-represented in our government

These are the 130 current members of Congress who have doubted or denied climate change

Elen Cranley  Apr 29, 2019, 1:36 PM

The climate change deniers in Congress are overwhelmingly Republican. Samantha Lee/Business Insider

Inhofe famously brought a snowball onto the floor in February 2015 as a bid to disprove climate change.

"With all of the hysteria, all of the fear, all of the phony science, could it be that man-made global warming is the greatest hoax ever perpetrated on the American people? It sure sounds like it."

—Senator Jim Inhofe, July 29, 2003

THE HOAX DEBUNKED: DON’T FEEL TOO SORRY FOR AL GORE

THE GREATEST HOAX
HOW THE GLOBAL WARMING CONSPIRACY THREATENS YOUR FUTURE

U.S. SENATOR JAMES INHOFE
Patrick Moore, co-founder of Greenpeace: “The whole climate crisis is not only Fake News, it’s Fake Science. There is no climate crisis, there’s weather and climate all around the world, and in fact carbon dioxide is the main building block of all life.”

@foxandfriends  Wow!
Analyzing Climate Denialism

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Top 10 Denialist claims (from Paul and Chris’ informal internet survey!)

1. The climate is always changing; it's natural.
2. The models are wrong.
3. The hockey stick is broken.
4. CO$_2$ is good! Plants need it.
5. Warming might be good for people and the planet.
6. The 97% consensus among scientists is wrong.
7. It's the sun, stupid.
8. It will cost too much to decarbonize the economy.
9. There's nothing we can do about global warming.
10. Scientists are raising alarm to secure more funding.
1. The climate is always changing; it's natural.

Rep. Robert Aderholt

"I fall into the second group of people who believe, as do many very credible scientists, that the earth is currently in a natural warming cycle rather than a man-made climate change," Aderholt wrote in a 2009 op-ed. "Many scientists believe that natural cycles of warming and cooling have existed since the beginning of Earth. If we take the current models of climate prediction and apply those same models to what actually happened in the last thirty years, the models are shown to be very flawed. In addition, what knowledge we do have of a warming period in the Middle Ages cannot be explained by current models which are focused on greenhouse gas reductions.”

Yes, but... the neither the pace of recent climate change and nor what’s driving it are natural – they are unprecedented.
2. The models are wrong.

"Climate change is nothing but a bunch of computer models that attempt to tell us what's going to happen in 50 years or 30. Notice the predictions are never for next year or the next 10 years. They're always for way, way, way, way out there, when none of us are going to be around or alive to know whether or not they were true."

— Rush Limbaugh on Sunday, February 17th, 2019 in an interview
"Broecker predicted by 2010 the world would have warmed by around 0.74C," Hausfather said. "In reality, it warmed by 0.62C, which is pretty good for a very rudimentary climate model in the 1970s."
3. The hockey stick is broken.

James Taylor is Director of the Arthur B. Robinson Center for Climate and Environmental Policy at The Heartland Institute. Taylor received his bachelor’s degree from Dartmouth College where he studied atmospheric science and majored in government. He received his Juris Doctorate from Syracuse University.

NEW HOCKEY STICK SENT TO THE PERMANENT PENALTY BOX

APRIL 5, 2013
By James Taylor

Climate Change Weekly #87

The “4,000-year hockey stick” scare is over, after a shelf life that did not last a full month.

Climate Change Weekly #87

The “4,000-year hockey stick” scare is over, after a shelf life that did not last a full month. The warmist-fawning media used the 4,000-year hockey stick to create one of the most intense global warming scares in recent memory, but it quickly died with a thud – just like so many asserted global warming scares before it.

A little-known scientist who had only recently completed his Ph.D. published a paper claiming proxy temperature reconstructions showed a 4,000-year decline in global temperatures until the twentieth century. The paper claimed the 4,000-year decline abruptly ended in the twentieth century as recent warmth obliterated the 4,000 years of cooling and placed the Earth at its warmest in the 4,000-year record. Moreover, the asserted rapid temperature spike during the past century appeared to be the sharpest in 11,000 years.
“Paleoclimatology draws upon a range of proxies and methodologies to calculate past temperatures. This allows independent confirmation of the basic hockey stick result: that the past few decades are the hottest in the past 1,300 years.”

https://skepticalscience.com/broken-hockey-stick.htm

..independent assessment of Mann's hockey stick by the National Center for Atmospheric Research (Wahl 2007). confirmed the principal results....
4. CO₂ is good! Plants need it.

Don’t Believe the Hysteria Over Carbon Dioxide

Rep. Lamar Smith / @LamarSmithTX21 / July 24, 2017 / 2 Comments

”The American people should be made aware of both the negative and positive impacts of carbon dioxide in the atmosphere.....The benefits of a changing climate are often ignored and under-researched.....A higher concentration of carbon dioxide in our atmosphere would aid photosynthesis, which in turn contributes to increased plant growth.... This correlates to a greater volume of food production and better quality food. Studies indicate that crops would utilize water more efficiently, requiring less water. “

Lamar has a B.A. in American Studies from Yale University and a J.D. from Southern Methodist University
Expert models don’t agree well with Lamar

Crop Yield Response to Warming in California’s Central Valley

- Alfalfa
- Safflower
- Maize
- Tomato
- Rice
- Wheat

5. Warming might be good for people and the planet

“We know humans have most flourished during times of warming trends. There are assumptions made that because the climate is warming that necessarily is a bad thing. Do we know what the ideal surface temperature should be in the year 2100 or year 2018?” “It’s fairly arrogant for us to think we know exactly what it should be in 2100.”

Pruitt has a bachelor's degrees in political science and communications. University of Tulsa law degree
Significant Errors in Study Suggesting Global Warming is Good for the World

The new issue of the Journal of Economic Perspectives includes a remarkable admission about a controversial academic paper that wrongly suggested moderate amounts of global warming would have an overall positive economic impact on the world.

Figure 2
Twenty-One Estimates of the Global Economic Impact of Climate Change

https://andthentheresphysics.wordpress.com/2014/05/05/tols-corrections/

Figure 4. Change in Magnitude of Extreme Heat Events with and without Global GHG Mitigation

Change in the extreme heat index (T990)—the temperature of the hottest four days, or 99th percentile, of the year—simulated by the IGSM-CAM for 2100 (average 1985-2105) relative to the baseline (average 1981-2010) (3°C).


For more information, visit EPA's "Climate Change in the United States: Benefits of Global Action" at www.epa.gov/cira.
6. There is no consensus among scientists

Oregon Institute of Science and Medicine (OISM) Petition

31,487 American scientists have signed this petition, including 9,029 with PhDs

One of several claims that large numbers of scientists do not agree with the theory of human-induced climate change

Petition

We urge the United States government to reject the global warming agreement that was written in Kyoto, Japan in December, 1997, and any other similar proposals. The proposed limits on greenhouse gases would harm the environment, hinder the advance of science and technology, and damage the health and welfare of mankind.

There is no convincing scientific evidence that human release of carbon dioxide, methane, or other greenhouse gases is causing or will, in the foreseeable future, cause catastrophic heating of the Earth’s atmosphere and disruption of the Earth’s climate. Moreover, there is substantial scientific evidence that increases in atmospheric carbon dioxide produce many beneficial effects upon the natural plant and animal environments of the Earth.

Please sign here

Please send more petition cards for me to distribute.

My academic degree is  B.S.  M.S.  Ph.D. in the field of  Physics

www.petitionproject.org
All evidence suggests there is agreement...

32,000 signatories out of 10.6 million qualified U.S. science graduates = \textbf{0.3%}

- OISM has never revealed how many people they canvassed (response rate is unknown)
- OISM has \textbf{not revealed its sampling methodology}
- No evidence ever given to support either statement in petition

Meanwhile...
- 7 independent, peer-reviewed, published studies indicate over 90% consensus among qualified scientists

Figure from Cook et al. (2016)
Sunspots reaching 1,000-year high

A new analysis shows that the Sun is more active now than it has been at any time in the previous 1,000 years.

Scientists based at the Institute for Astronomy in Zurich used ice cores from Greenland to construct a picture of our star's activity in the past.

Over the past few hundred years, there has been a steady increase in the numbers of sunspots, a trend that has accelerated in the past century, just at the time when the Earth has been getting warmer.

The data suggests that changing solar activity is influencing in some way the global climate causing the world to get warmer.

Over the past 20 years, however, the number of sunspots has remained roughly constant, yet the average temperature of the Earth has continued to increase.

This is put down to a human-produced greenhouse effect caused by the combustion of fossil fuels.
Not in recent history, not powerful enough

Some rise in solar radiation, but none in last 40+ years

When compared to other climateforcers, change in solar is weak
8. It will cost too much to decarbonize the economy

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<thead>
<tr>
<th></th>
<th>Supply-side</th>
<th>Demand-side</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Restrictive</strong> (of fossil fuels)</td>
<td>Keep carbon in the ground</td>
<td>Nudge consumers away from carbon</td>
</tr>
<tr>
<td><strong>Supportive</strong> (of alternatives)</td>
<td>Boost supply of alternative energy technology</td>
<td>Encourage consumers to use alternative energy technology</td>
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All options (or combination of options) will require significant economic costs immediately.
It will cost too much to *not* decarbonize the economy.

Over long-term, RCP6 & 8.5 are the least profitable. Early savings dwarfed by later costs of damage and disruption.

Figure from NYU Law School
9. There’s nothing we can do
We will have to make some adaptations, but we can avoid much worse impacts by mitigating emissions now.
10. Scientists are raising alarm to secure more funding

Climate scientists are getting rich off federal grant money... of course they’ll keep saying there’s a problem!
With our degrees, we could make more money elsewhere.

The truth is, climate scientists could make more money in other fields or industry (especially the fossil fuel industry).
Willie Soon, Ph.D.

Credentials:

- Ph.D., Aerospace Engineering, USC (1991)
- Aerospace engineer at Harvard-Smithsonian Center for Astrophysics
- Astronomer at Mount Wilson Observatory

Documents released under the Freedom of Information Act show that every grant Dr. Soon has received since 2002 has been from oil or gas interests. His most famous publication (Soon and Baliunas, 2003) attempted to disprove the Hockey Stick diagram. In response to the article being published, three of the editors of the publishing journal resigned in protest.
S. Fred Singer, Ph.D.

Credentials:

- Ph.D., Physics, Princeton (1948)
- First director of U.S. National Weather Satellite Service (1962-1964)
- Former professor at the University of Virginia (1971-1994)

Former space scientist. He has been on the wrong side of science for decades: formerly tobacco and ozone, acid rain, DDT, and asbestos, now climate. Has been receiving US $5,000 per month from the Heartland Institute for years. Lied to IRS.
THINK – PAIR – SHARE How is the logic employed in these reports (and this graph) faulty?
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Organized Climate Denial – it’s big and important

• The Trump Administration (we’ve talked enough about that)
• Fossil Fuel companies (Exxon in the lead)
• Conservative “Think Tanks” – Cato Institute, Heritage Foundation, Heartland Institute

Much of the argument is grounded in non consensus financial models

Heritage vs Experts on the Future Costs of Wind and Solar Energy

Capital Costs of Wind Generation, 2022 (2014$ per Watt$_{ac}$)

Capital Costs of Utility Scale Solar PV, 2022 (2014$ per Watt$_{ac}$)

https://www.wri.org/blog/2017/03/heritage-foundation-gets-it-wrong-costs-and-benefits-climate-action
Fossil Fuel Companies as climate denial “encouragers”

Climate scientists are as sure that burning fossil fuels causes global warming as public health scientists are sure that smoking tobacco causes cancer.

The fossil fuel industry’s denial and delay tactics come straight out of Big Tobacco’s playbook.

John Cook, Center for Climate Change Communication, George Mason University
Geoffrey Supran, Department of the History of Science, Harvard University
Stephan Lewandowsky, School of Psychological Science, University of Bristol
Naomi Oreskes, Department of the History of Science, Harvard University
Edward Maibach, Center for Climate Change Communication, George Mason University
Figure 2: Exxon 1977 internal memo. Fossil fuel industry documents show that they knew the basics of climate science in the 1950s-80s.

**SUMMARY**

I. **CO₂-release most likely source of inadvertent climate modification.**

II. **Prevailing opinion attributes CO₂ increase to fossil fuel combustion.**

III. **Doubling CO₂ could increase average global temperature 1°C to 3°C by 2050 A.D. (10°C predicted at poles).**

IV. **More research is needed on most aspects of greenhouse effect.**

V. **5-10 yr. time window to get necessary information.**

VI. **Major research effort being considered by DOE.**

**CO₂ emissions will cause 1-3°C warming.**

**Time is running out!**

**CO₂ is causing climate change.**

**CO₂ comes from burning fossil fuels.**
Fossil fuel schemed (1980s-90s)

**EXXON'S POSITION**
- Cast doubt on the science.
- Emphasize the uncertainty in scientific conclusions regarding the potential enhanced Greenhouse effect.
- Urge a balanced scientific approach.
- Use “both sides” approach to confuse people.
- Greenwashing: pretending to care about the environment.

**STRESS ENVIRONMENTALLY SOUND ADAPTIVE EFFORTS**
- Improve Understanding
  - Extend the Science
  - Include the Costs/Economics
  - Face the Socio-Political Realities
- Support Conservation
- Restrict CFCs
- Improve Global Re/De Forestation

**Victory Will Be Achieved When:**
- Average citizens “understand” (recognize) uncertainties in climate science: recognition of uncertainties becomes part of the “conventional wisdom”.
- Media “understands” (recognizes) uncertainties in climate science.
- Media coverage reflects balance on climate science and recognition of the validity of viewpoints that challenge the current “conventional wisdom”.

**Making the public think scientists don’t know anything for sure.**

Figure 3: Top: Exxon 1988 internal memo. Middle: Exxon 1989 internal memo. Bottom: Exxon et al. 1998 internal memo. Fossil fuel industry documents show that they devised public relations strategies to promote doubt about climate science in the 1980s-90s.
Raising doubts that persist today

**Unsettled Science**

Knowing that weather forecasts are reliable for a few days at best, we should recognize the enormous challenge facing scientists seeking to predict climate change and its impact over the next century. In spite of everyone’s desire for clear answers, it is not surprising that fundamental gaps in knowledge leave scientists unable to make reliable predictions about future changes.

Moreover, computer models relied upon by climate scientists predict that average atmospheric temperatures will rise as fast as or faster than temperatures at the surface. However, only within the last 20 years have reliable global measurements of temperatures in the lower atmosphere been available through the use of satellite technology. These measurements show little or no warming.

Even less is known about the potential positive or negative impacts of climate change. In fact, many academic studies and field experiments have demonstrated that increased levels of carbon dioxide can promote crop and forest growth.

So, while some argue that the science debate is settled and governments should focus only on near-term policies—that is, empty rhetoric, future scientific research will help us understand how human actions and natural climate change may affect the world and will help determine what actions may be desirable to address the long-term.

Geological evidence indicates that climate and greenhouse gas levels experience significant variability for reasons having nothing to do with human activity. Historical records and current scientific evidence show that Europe and North America experienced a medieval warm period one thousand years ago, followed centuries later by a little ice age. The geological record shows even larger changes throughout Earth’s history. Against this backdrop of large, poorly understood natural variability, it is impossible for scientists to attribute the recent small surface temperature increase to human causes.

**False:** In the 1990s, scientists had already formed a consensus that humans were causing global warming.

**Just because climate has changed naturally in the past does not mean it’s natural now.**

**Cast doubt on the scientific consensus on climate change.**

**Contradicts themselves: they already talk about 1 degree warming.**

**Uses the same delay argument as the tobacco industry: “Let’s wait before we act.”**

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*Figure 4: ExxonMobil 2000 advertorial in The New York Times.*
A major source of institutionalized climate denial
Panel 3: Scientific Observations

Speakers: Craig Idso; Patrick Michaels; Anthony Watts; H. Sterling Burnett (moderator). This panel will cover: Doctored datasets vs. temperature reality; the real-world benefits of CO2 and a warmer climate; an international view of climate change alarmism and the United Nations.

Panel 4: Winning Public Policy Options

Speakers: Myron Ebell; Douglas Pollock; James Taylor; Tom Harris (moderator). This panel will cover: Political suicide of CO2 taxes, the Green New Deal, and renewable mandates; Trump’s climate victories and what comes next; winning arguments for skeptics of a human-caused climate catastrophe.
What strikes you about the conference speakers?

Shorter Conference, Fake Sponsor, Low Attendance, and a Lot of Gray Haired Men

In 2008, Heartland’s climate conference was a three day affair. Over a decade later, it is down to a single day. In 2008, the event drew over 50 co-sponsors. This year’s (2019) conference pamphlet listed only 16. And as it turns out, one of those was fake.
Numbers on their faces represent peer-reviewed publications relate to climate science.
The distortions of science continue to the next generation

Three lead NIPCC authors – Craig Idso, Robert M. Carter, and S. Fred Singer – wrote a small book titled *Why Scientists Disagree About Global Warming: The NIPCC Report on Scientific Consensus* revealing how most scientists do not support the alarmist claims of the Intergovernmental Panel on Climate Change.

The Heartland Institute mailed some 300,000 copies of the second edition of this book to K-12 and college science teachers across America.
Assemble people who communicate well and sow doubt in those citizens with little expertise in climate science.
Among climate scientists, there is no doubt...among politicians...well not much
The basic facts of climate change, established over decades of research, can be summarized in five key points:

- **Global warming is happening.**
- **Human activity is the main cause.**
- **There's scientific consensus on human-caused global warming.**
- **The impacts are serious and affect people.**
- **We have the technology needed to avoid the worst climate impacts.**
Your assignment - write an OP-ED for your hometown paper.

Focusing on the same climate system you have considered all semester, write a 400-600 word persuasive essay. **GIVE YOUR ESSAY A CATCHY TITLE!**

In your OP-ED: 1) STATE the problem. 2) EXPLAIN how the system works including how it has changed in the past. 3) PROVIDE EVIDENCE that this problem is going to affect people now and in the future, and 4) most importantly, SUGGEST SOLUTIONS.

Your work needs to be well written, polished, and carefully proofread.

The folks at the Writing Center are your friends on this one. If you want some help, please, consult them. Here's the website: https://www.uvm.edu/undergradwriting
The goal here to finish our time together with something positive and forward looking.

You all can take what you have learned and make UVM and our world a better place.
Thursday – we’ll spend much of the class on this final essay – join us!

- Chris will give you climate communication pointers from his workshop in California
- Josh Brown, UVM Environmental Writer will share his secrets on how to write your most persuasive essay
- We’ll get your feedback on how to make this the best climate class we possibly can!