

# *Science Denial*

*a case of misplaced skepticism*

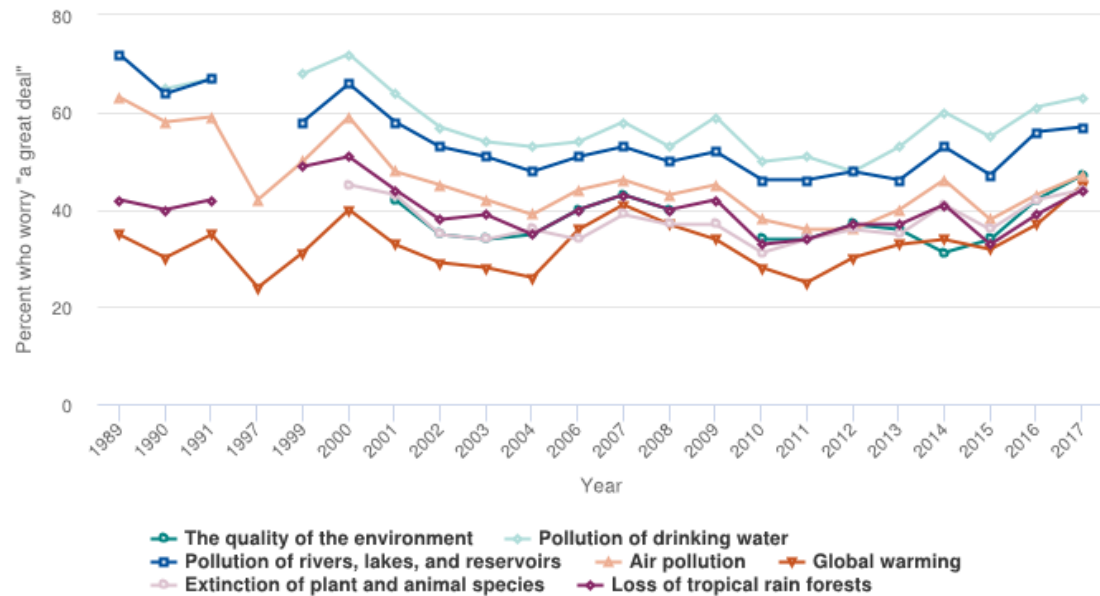


George Matthews, Plymouth State University

2020

Figure 7-17

Concern about specific environmental issues: 1989–2017



Note(s): Data are not available for all years. Responses to the following: *How much do you personally worry about [specific environmental issues]: a great deal, a fair amount, only a little, or not at all?* Figure shows only responses for "a great deal." Poll is conducted annually in March.

Source(s): Gallup, Climate Change: Environment, <http://www.gallup.com/poll/1615/environment.aspx#>, accessed 12 April 2017.

*Science and Engineering Indicators 2018*

## *Many Forms of Climate Change Denial*

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## *Many Forms of Climate Change Denial*

1. The Earth's climate is not in fact changing and the evidence does not support that it is.

*variation:* Evidence that it is changing is fraudulent.

2. It is changing but the change is natural and not caused by us.

3. It is caused by us, but it is a bad idea to try to stop it.

*variation:* Maybe it is even a good thing that it is happening!

## *Some questions*



*How can we tell the difference between good and bogus claims to scientific knowledge?*

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*Does science depend on a single method, and if not does "anything go?"*



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*How can we tell the difference between good and bogus claims to scientific knowledge?*



*Does science depend on a single method, and if not does "anything go?"*



*Why should we trust scientific findings and how is this trust different than faith?*

## *The Hypothetico-Deductive Method*

If this **theory** is true, then this **consequence** should happen.

The **consequence** does happen.

---

Therefore the **theory** is true.

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VALID

INVALID

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The fallacy of affirming the consequent.

## *Validation?*

If vitamin C cures colds, then you should feel better after taking Vitamin C.

I do feel better after taking Vitamin C.

---

Therefore Vitamin C cures colds.

## *Validation?*

If climate change is caused by increased greenhouse emissions, then temperatures should rise as emissions rise.

Temperatures do rise as emissions rise.

---

Climate change is caused by increased greenhouse emissions.

## *Validation?*

If climate change is caused by increased greenhouse emissions, then temperatures should rise as emissions rise.

Temperatures do rise as emissions rise.

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Climate change is caused by increased greenhouse emissions.

What about other possible explanations of rising temperatures such as the wobble of the earth, sunspots, etc.?

## *A Stronger Argument*

If vitamin C cures colds, then you should feel better after taking Vitamin C, and you shouldn't feel better if you don't take it.

Whoever takes Vitamin C feels better and those who do not take it don't feel better.

---

Therefore Vitamin C cures colds.



**SUGGESTED USE:** Shake well, Place one full dropper 1 or 2 times daily under tongue, hold 60 seconds, then swallow; use consistently for best results.

**SAFETY WARNING:** Keep out of reach of children. Do not use if safety seal is broken or tampered.

**STORE** at room temperature away from humidity, heat and light.

Lot# DR112117T1 Exp Date: 03/2020

\*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease. If you are pregnant, nursing, taking medications, or have a medical condition, consult your physician before using this product.



# Hemp Oil

Zero THC

## Full Spectrum

### 250MG

#### Peppermint Flavor Tincture

Dietary Supplement | Net Wt. 1oz (30ml)

#### SUPPLEMENT FACTS

Serving Size: 1 ml (1 dropper)

Servings per Container: 30

Amount Per Serving	% Daily Value
<b>Phyto-Rich Full Spectrum Hemp Oil</b>	<b>8.33 mg †</b>

\*Percent Daily Values based on a 2,000 calorie diet.

† Daily Value not established

**OTHER INGREDIENTS:** Organic Coconut Oil (MCT), Organic Peppermint Oil.

Made in USA, Organically Grown Hemp per Farm Bill, Non-GMO, No Heavy Metals, No Solvents, No THC, Third Party Lab Tested.

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Customer care: cc@brainyplants.com

## *A Better Argument*

If climate change is caused by increased greenhouse gases, then temperature should rise as emissions rise, and fall as emissions fall.

Temperature rises as emissions rise, and falls as emissions fall.

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Climate change is caused by increased greenhouse gases.

## *A Better Argument*

If climate change is caused by increased greenhouse gases, then temperature should rise as emissions rise, and fall as emissions fall.

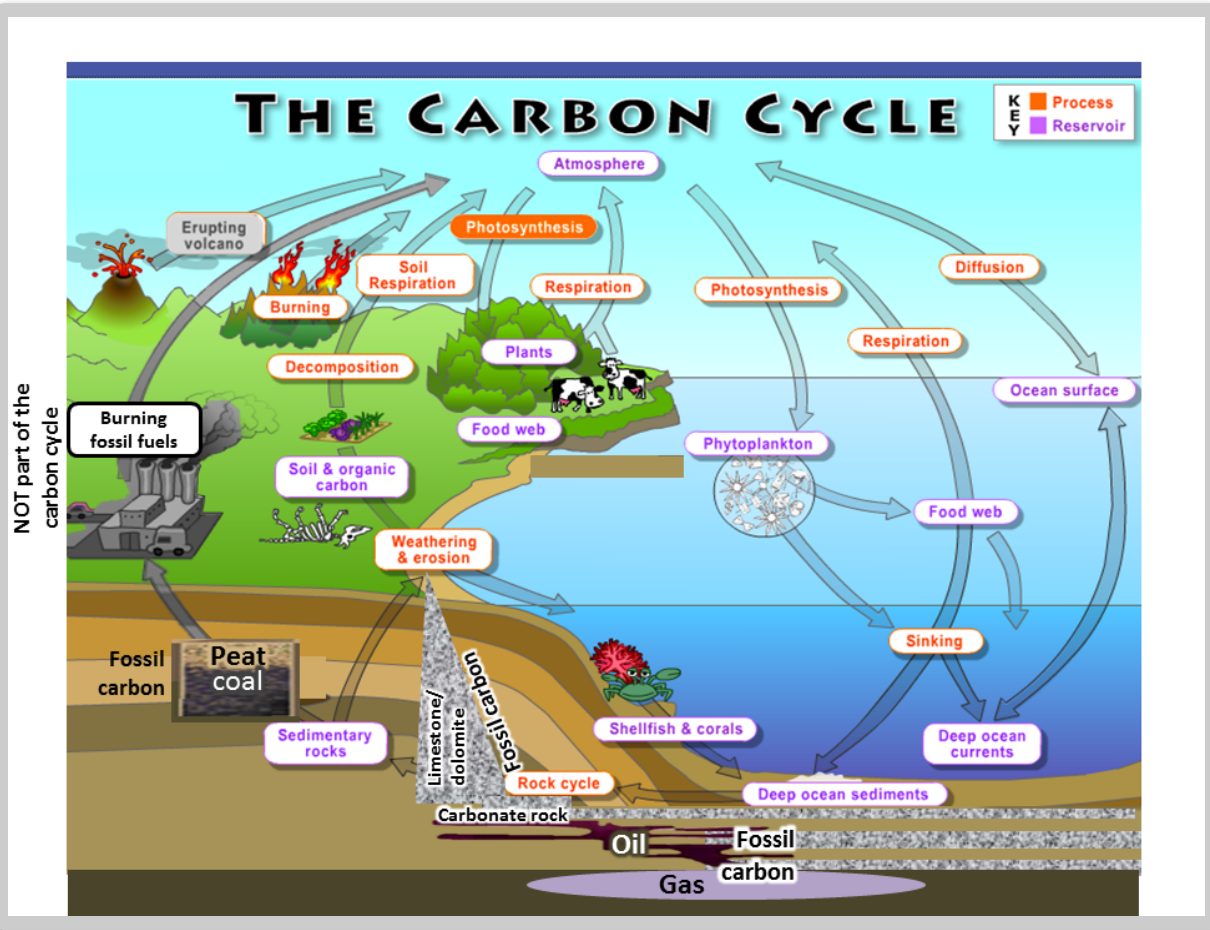
Temperature rises as emissions rise, and falls as emissions fall.

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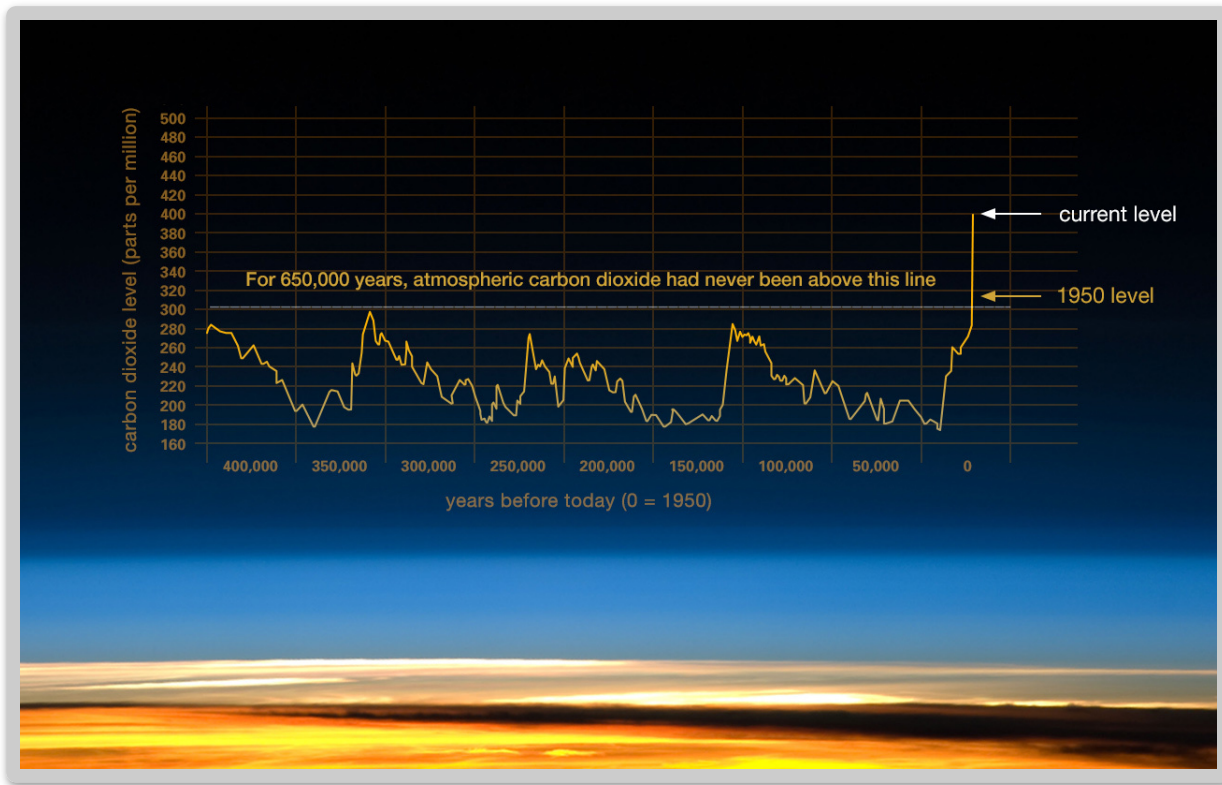
Climate change is caused by increased greenhouse gases.

This seems promising but how can we lower emissions now to test this hypothesis?

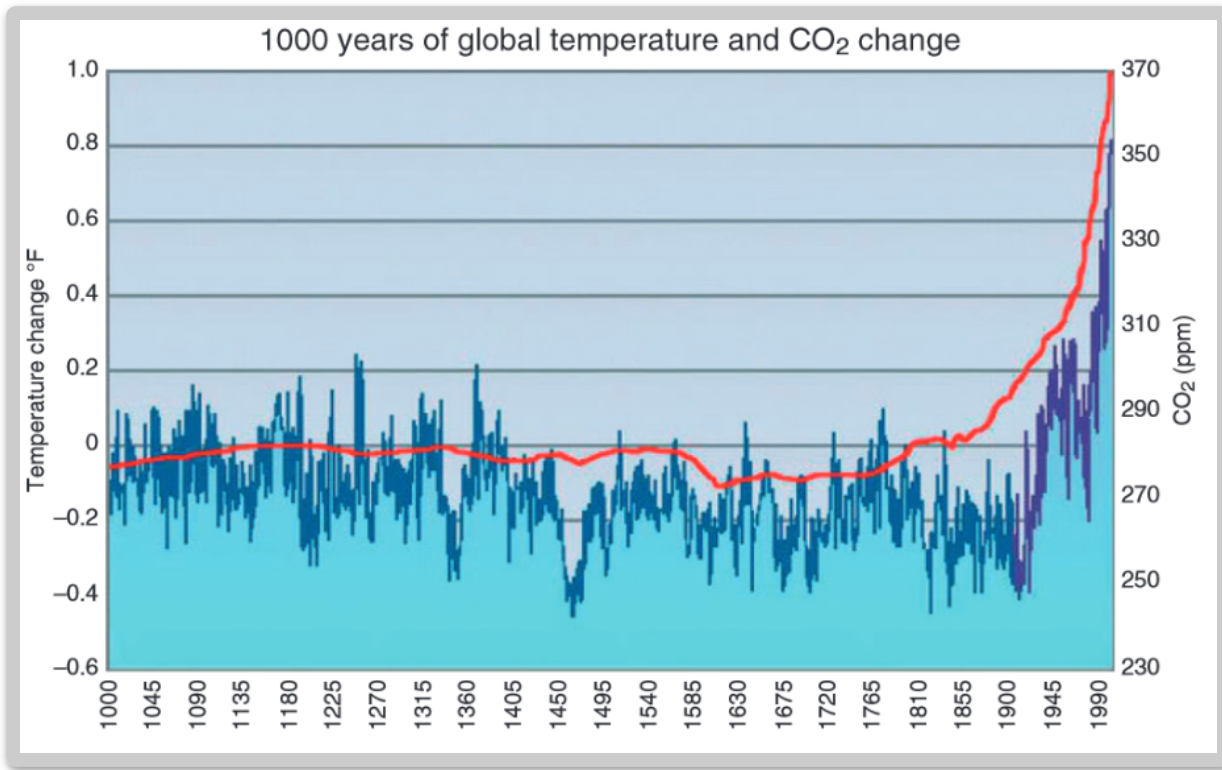
# Build Models



## *Take account of confounding variables*



## *Establish clear correlations*



## *Many indicators*

If climate change is occurring we should see **many independent indicators of change**.

We seem them all.

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Therefore climate change is occurring.

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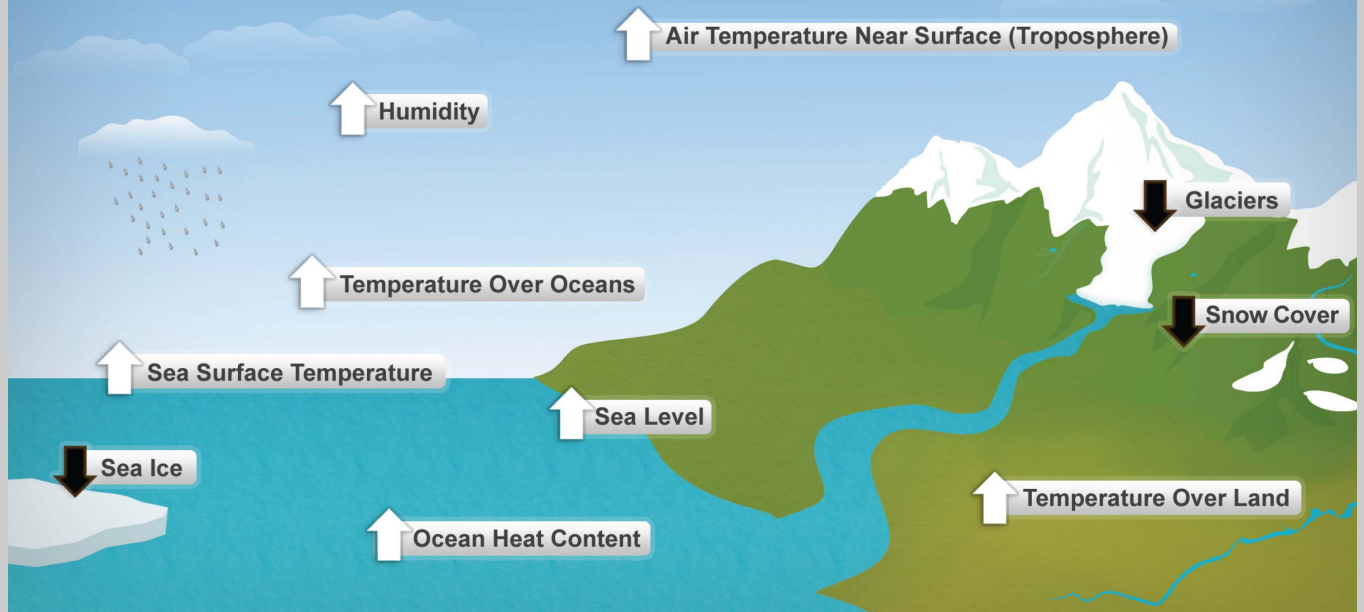
VALID

INVALID

STRONG



## Ten Indicators of a Warming World







## *Is there really debate?*

If there is consensus about human-caused climate change, scientists would all agree.

But they don't all agree.

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Therefore there is no consensus and the debate is unsettled.

VALID

INVALID

UNSOUND

*Find out more*

The Pillars of Climate Change Denial

NASA: Vital Signs of the Planet

Podcast - Defending Science From Denial



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