Science Denial

a case of misplaced skepticism

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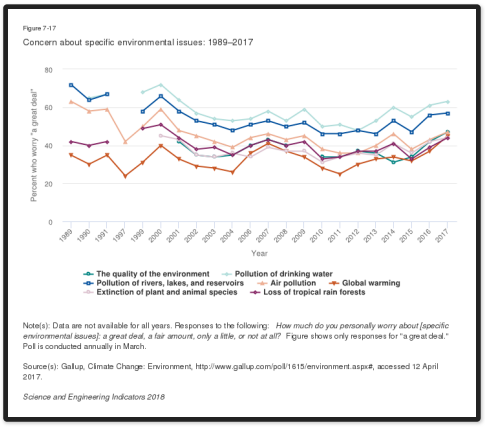


Many Forms of Climate Change Denial

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?*

? *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.

VALID INVALID

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.

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.

A Better Argument

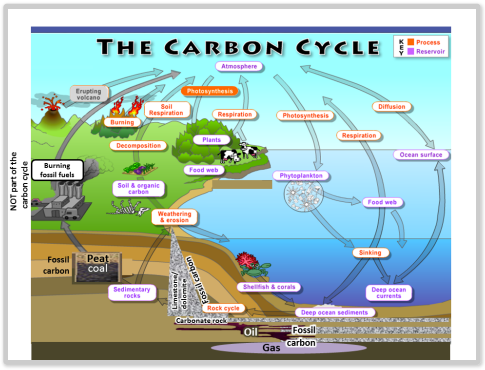
If climate change is caused by increased greenhouse gases, then temperature should rise as emissions rise, and fall as emissions fall.

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

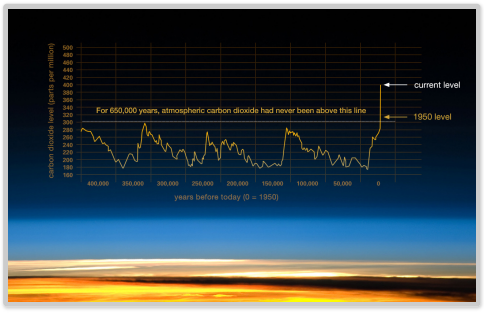
Climate change is caused by increased greenhouse gases.

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

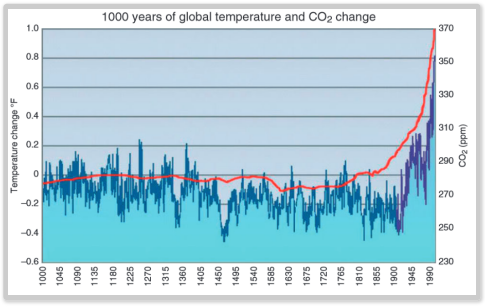
Build Models



Take account of confounding variables



Establish clear correlations



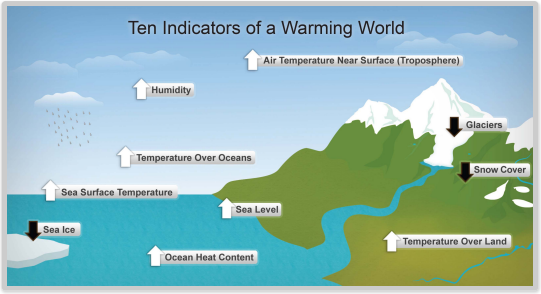
Many indicators

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

We seem them all.

Therefore climate change is occurring.

VALID INVALID STRONG



Is there really debate?

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

But they don't all agree.

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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