

Petroleum, Energy, Injustice, and Science Denial

Stevan Harrell

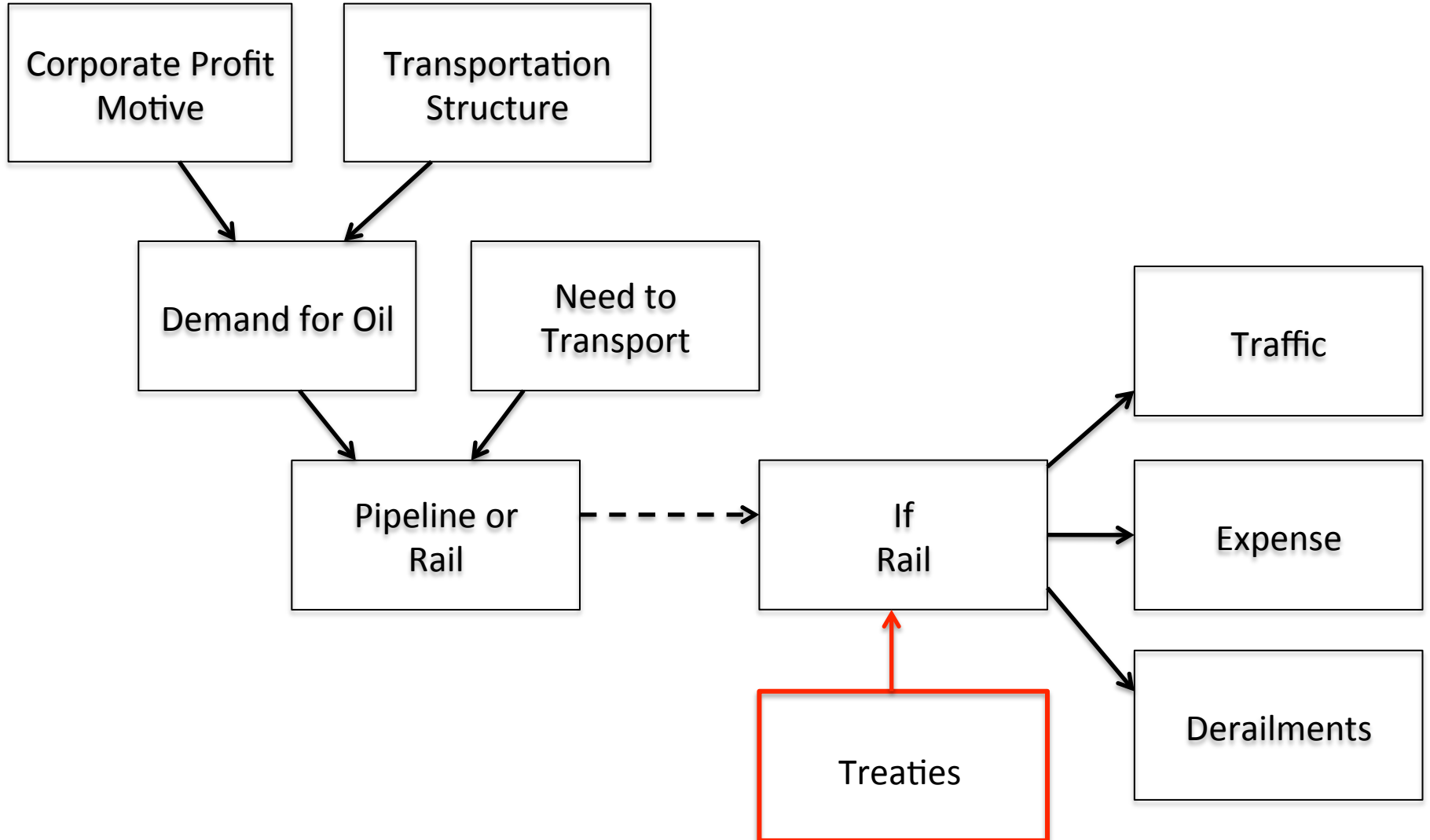
Anthropology 210

16 February 2017

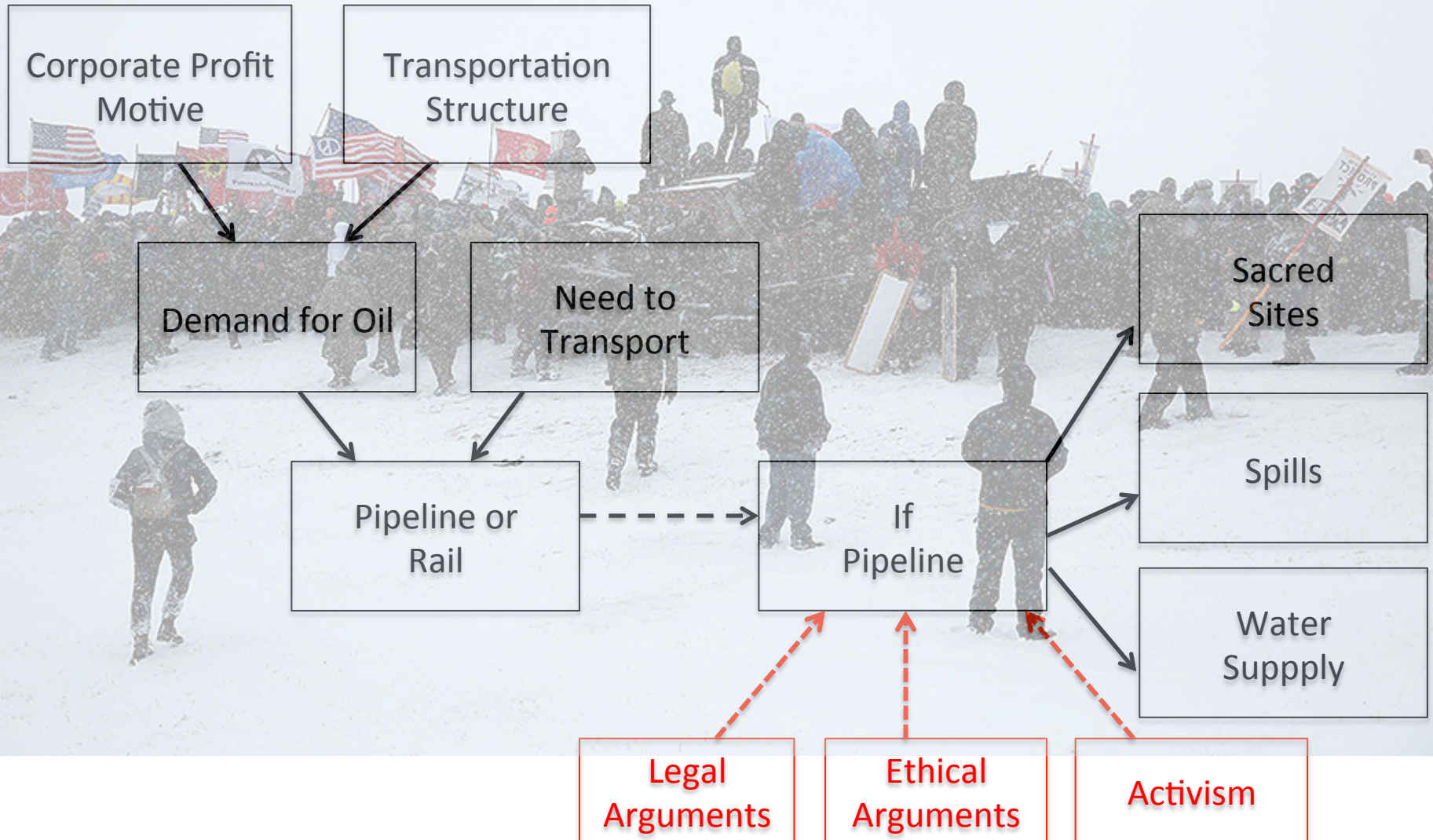
Yuxweluptun: Red Man Watching White Man Trying to Fix Hole in the Sky



Treaties Mean Something



Dakota Access Pipeline



Three kinds of legal land status



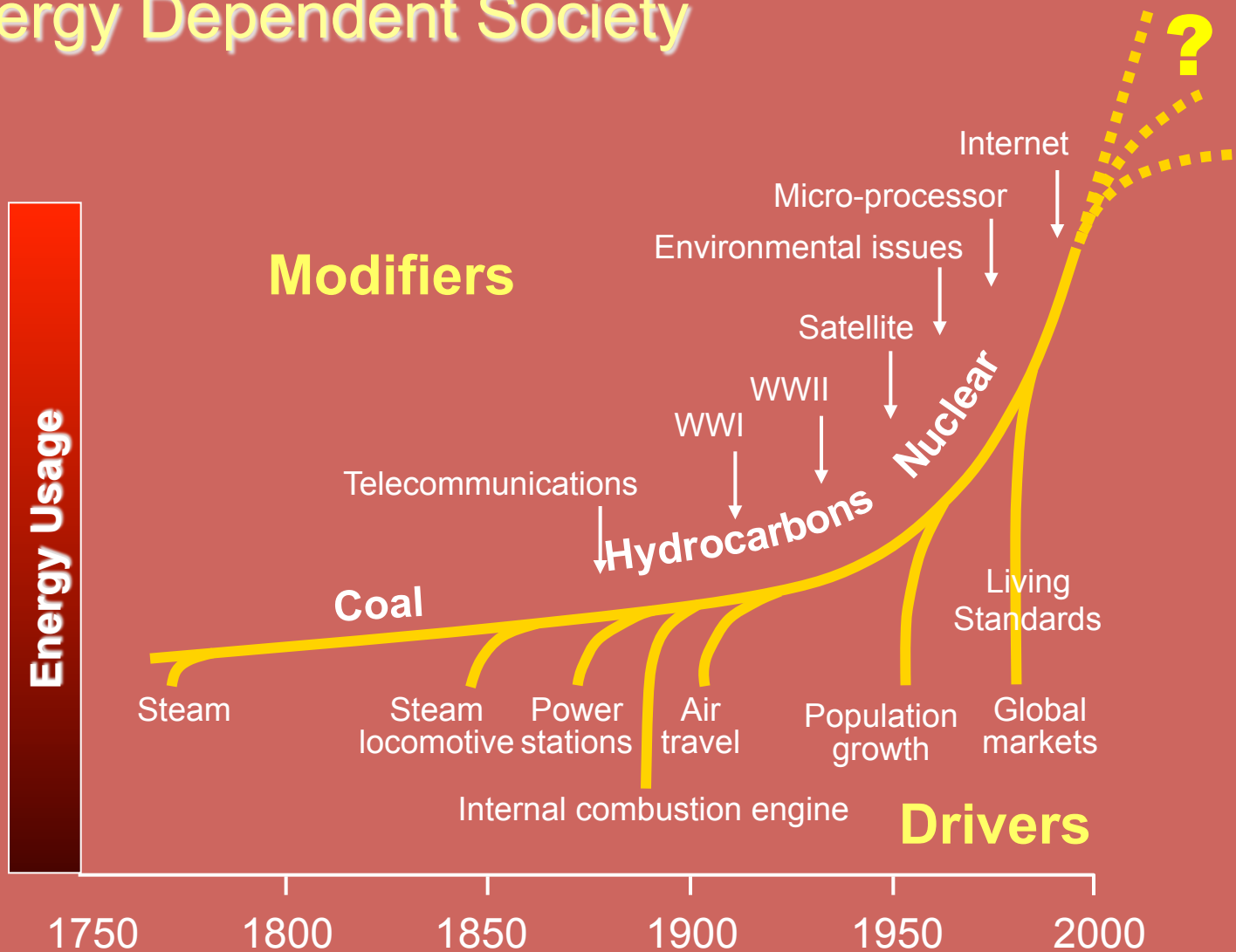
DAPL and Lake Charles

- [Other disputes along the DAPL route](#)
- Keystone XL Pipeline
- [Landscape around Lake Charles](#)

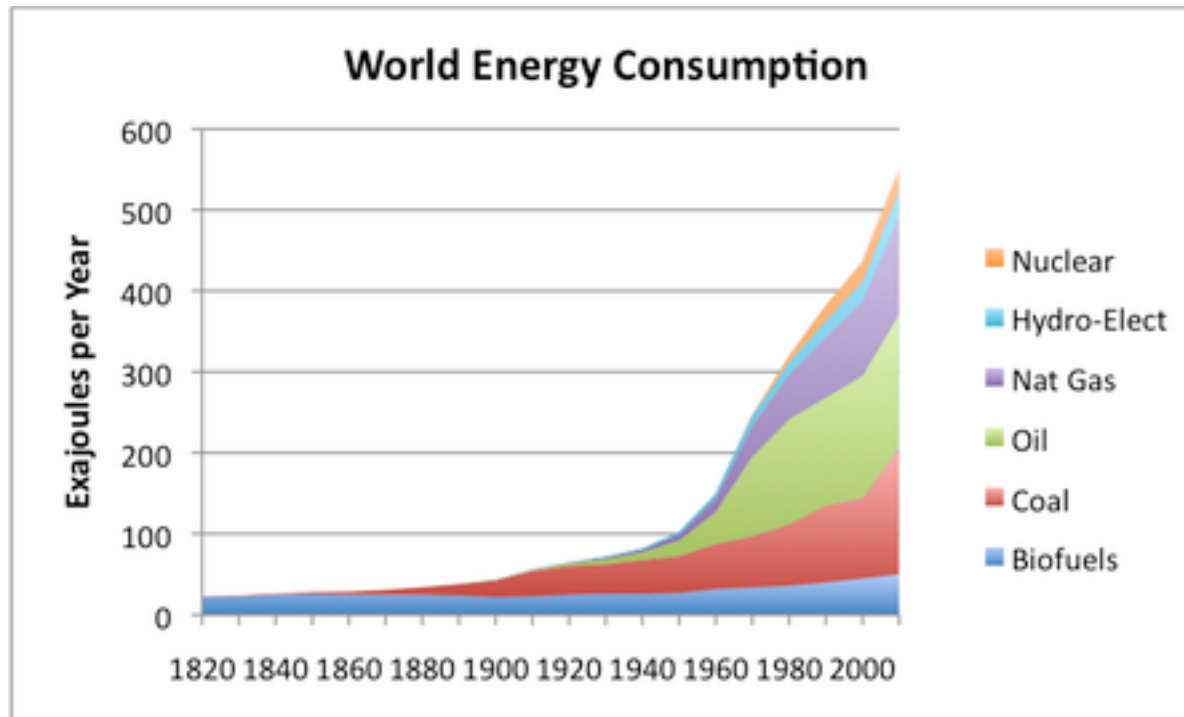


Energy Usage: 1750-2000

An Energy Dependent Society

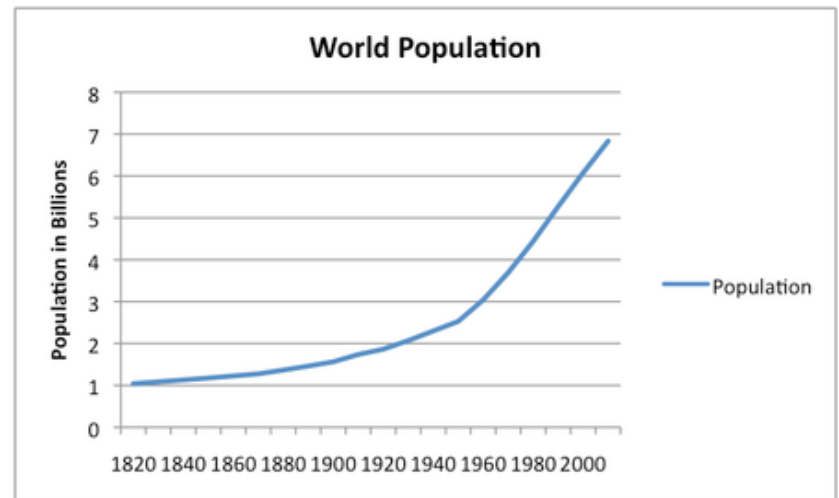
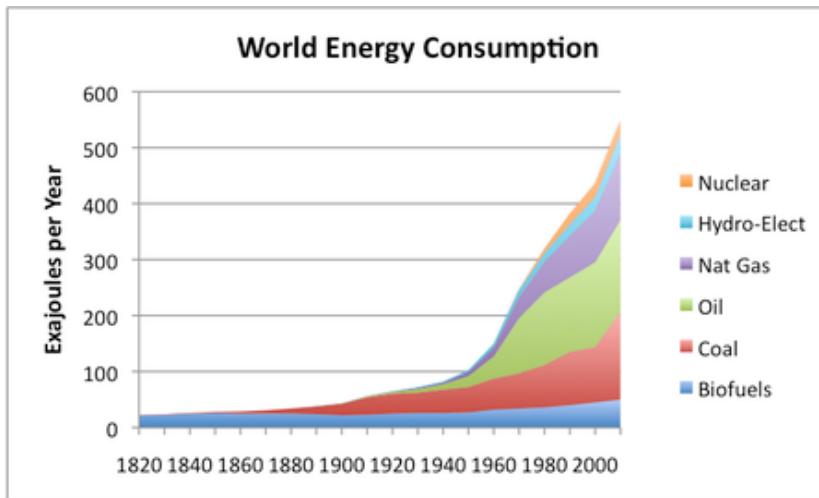


A series of really cool charts on world energy history

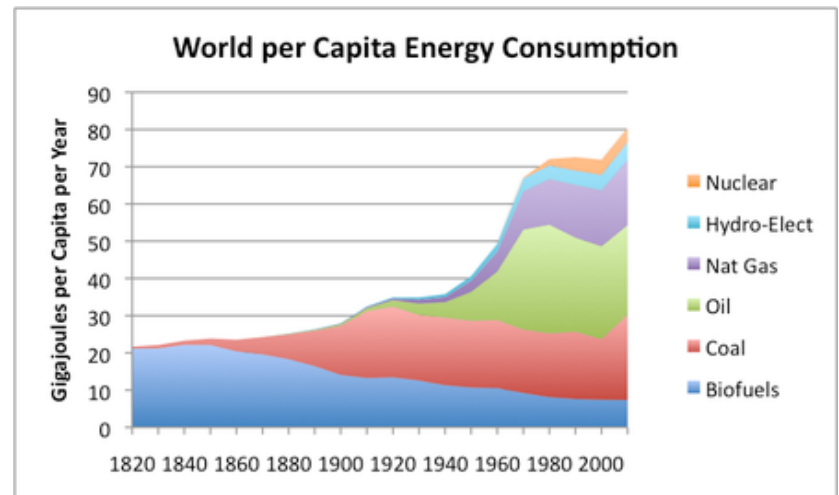


Source: Gail Tvarberg, [Our finite world](#).

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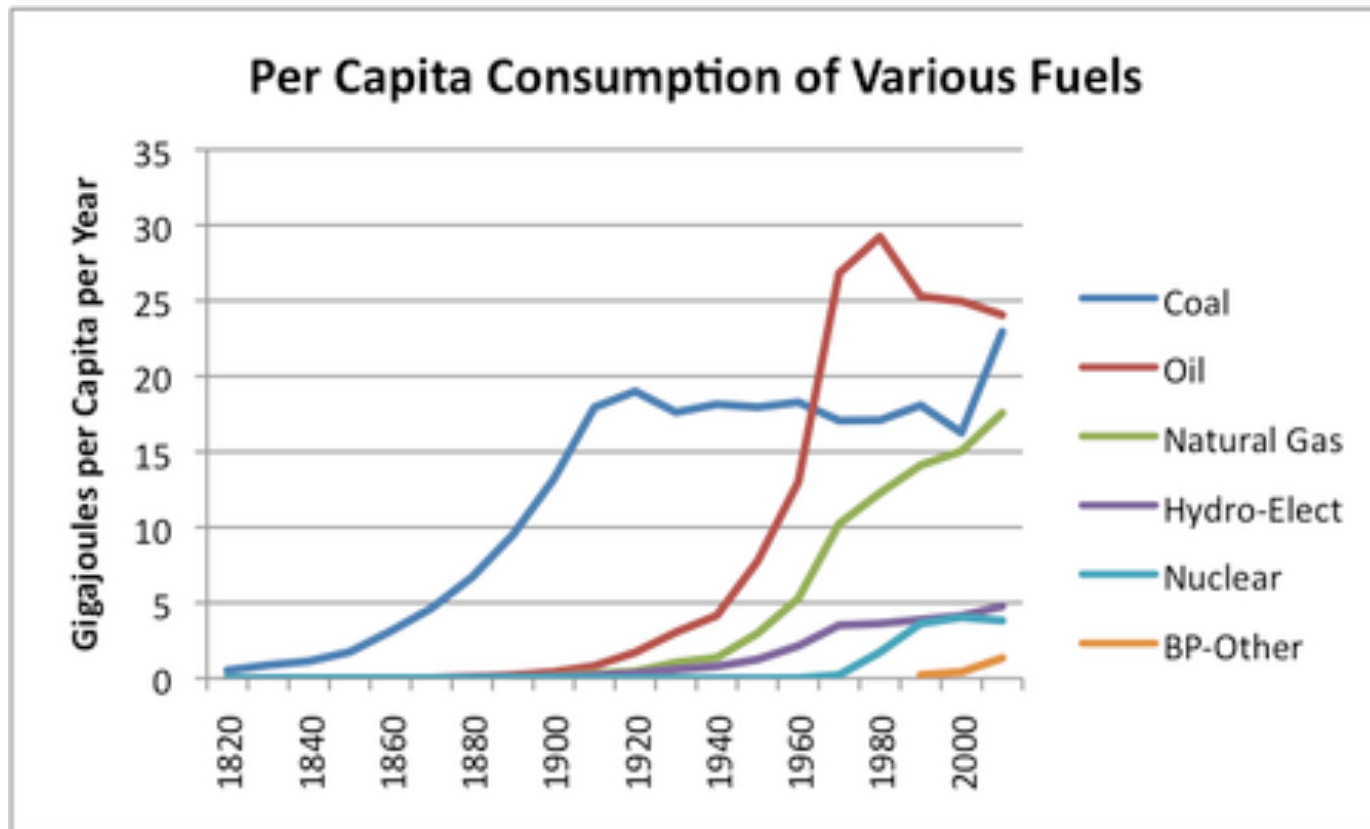


Remember $I=PAT$?



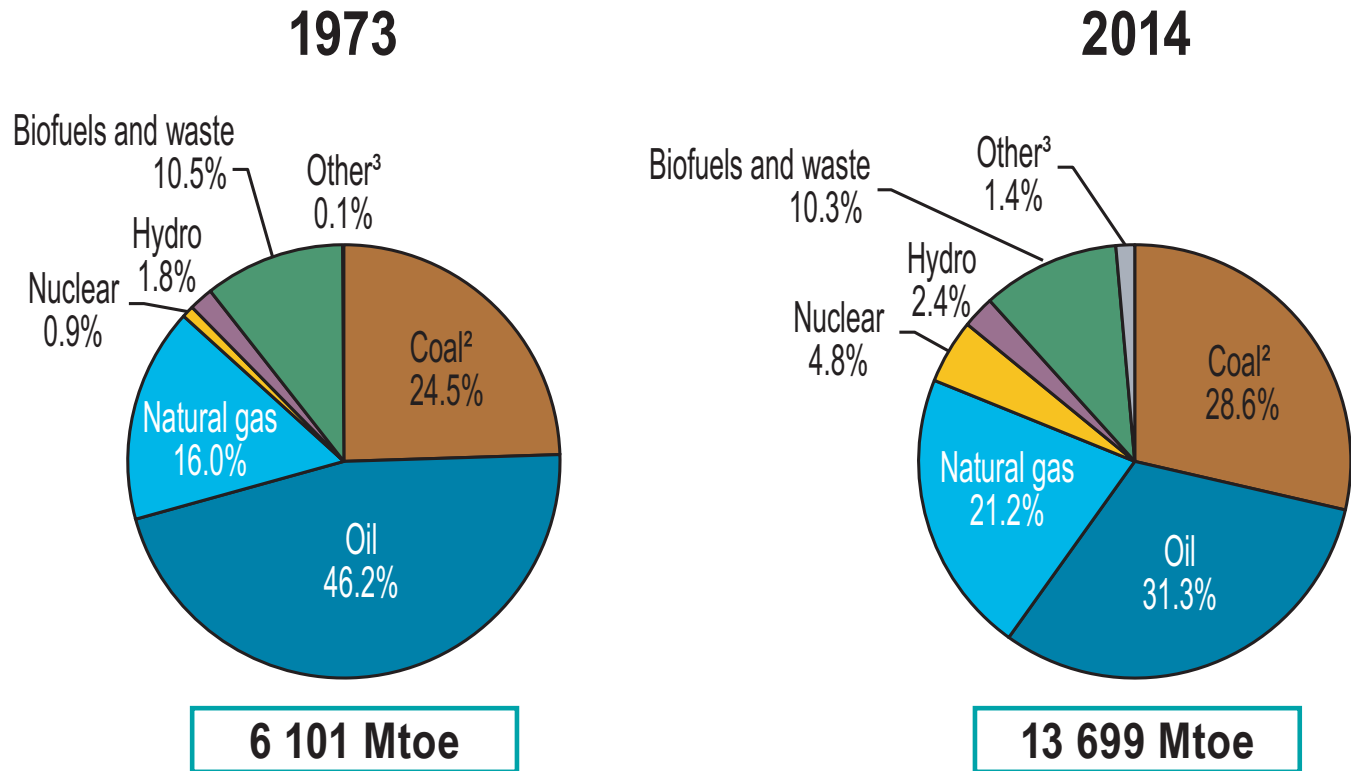
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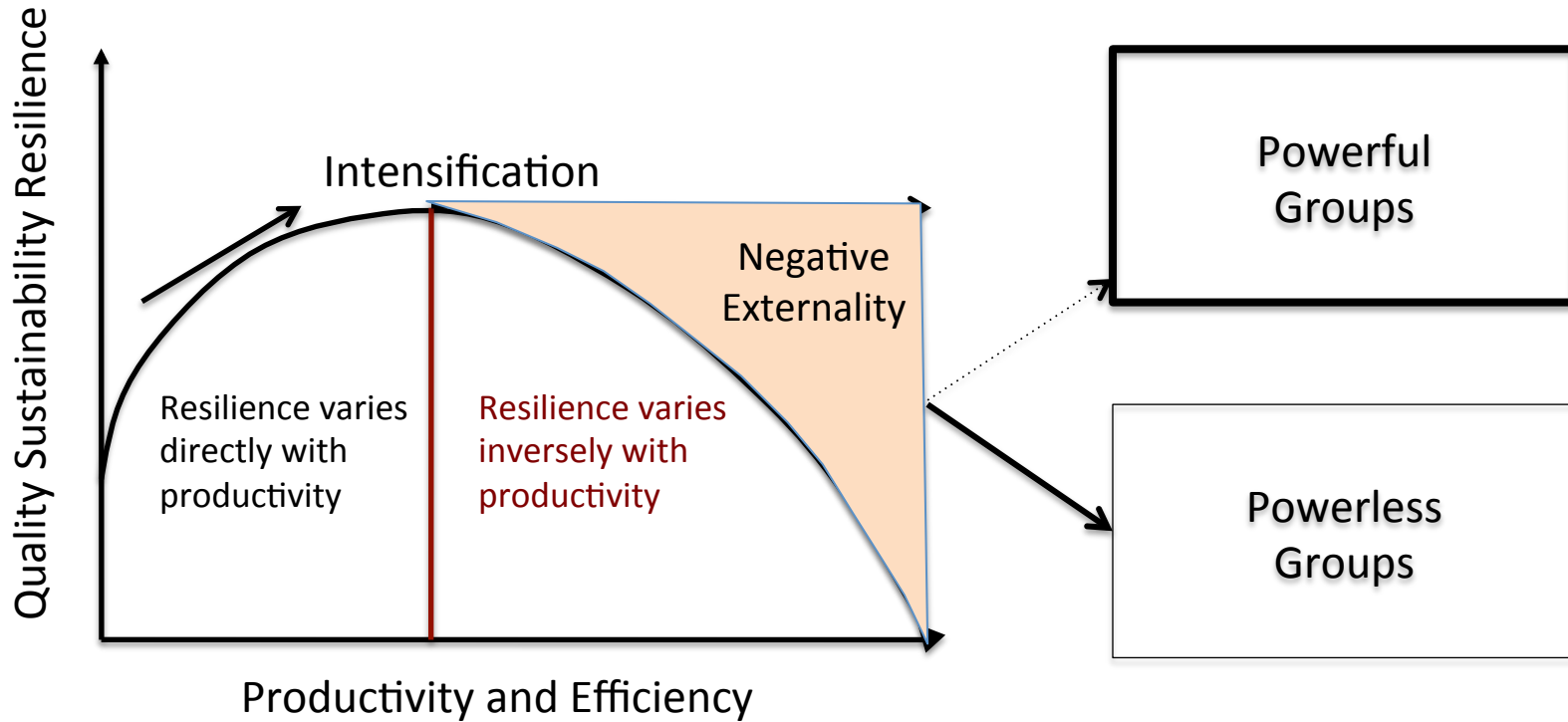


World energy supplies, 1971-2014

1973 and 2014 fuel shares of TPES

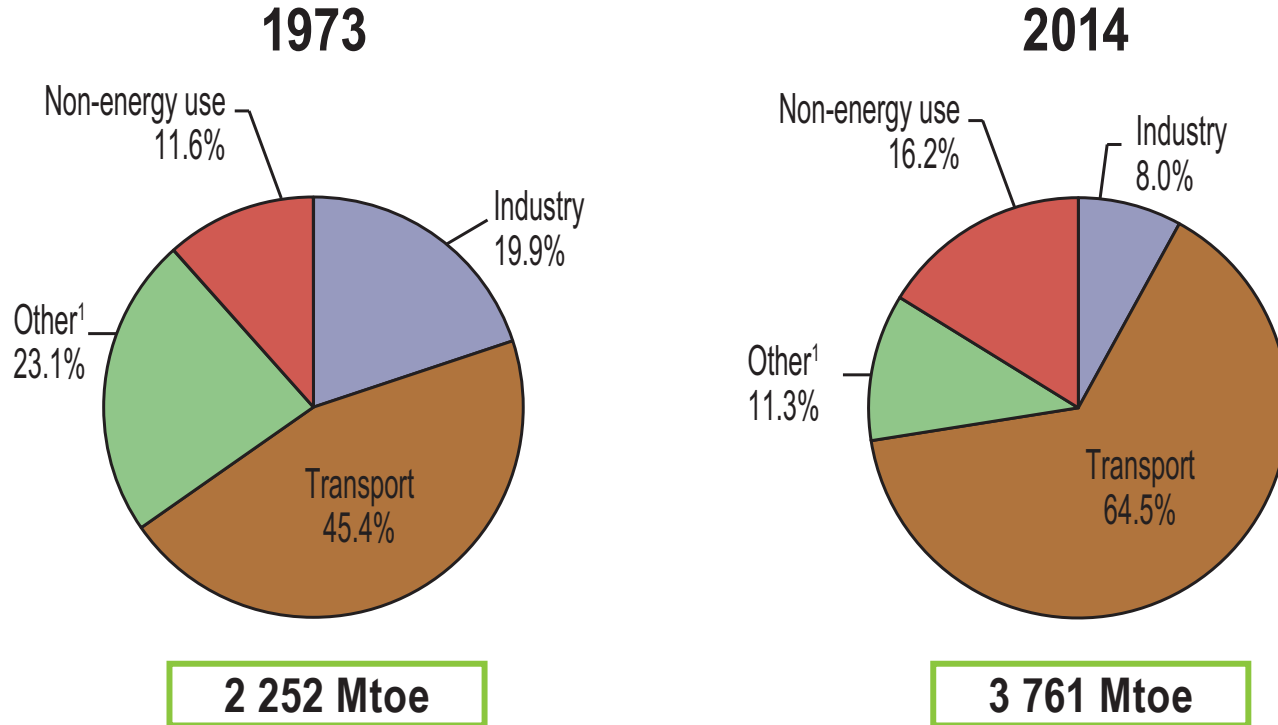


Encapsulating Environmental Injustice



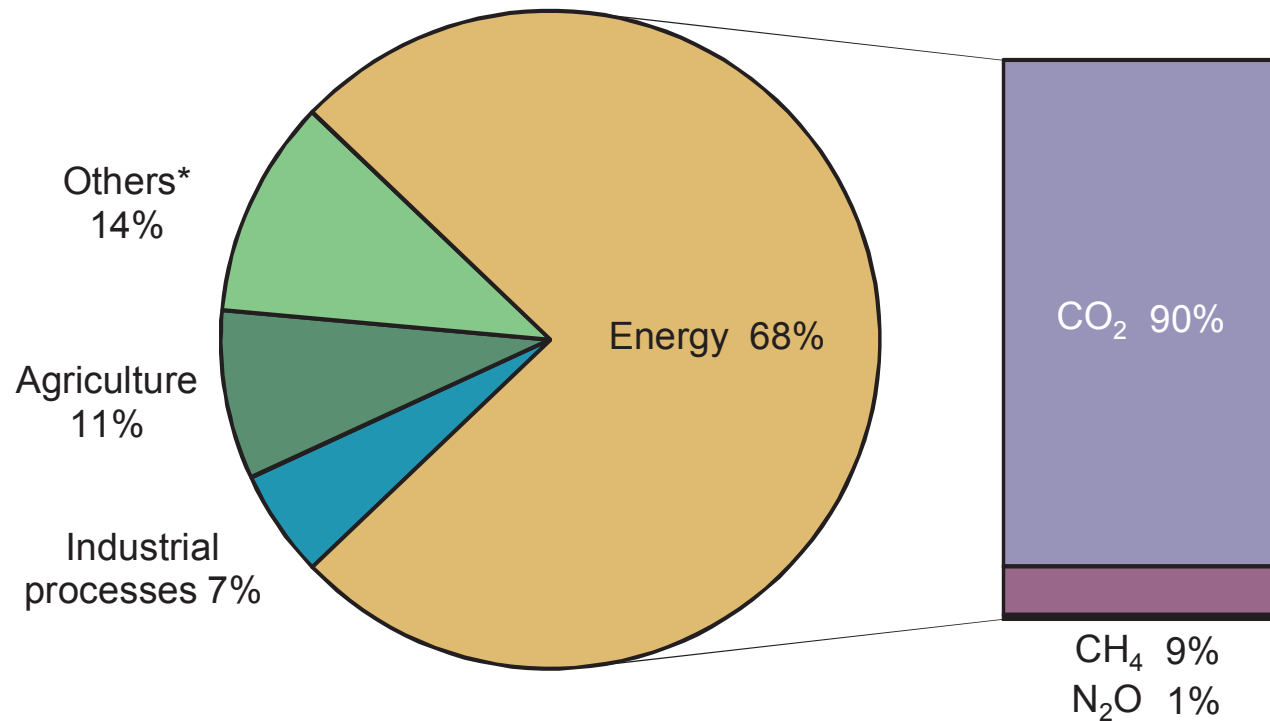
Uses of Petroleum

1973 and 2014 shares of world oil consumption



Shares of Anthropogenic GHG

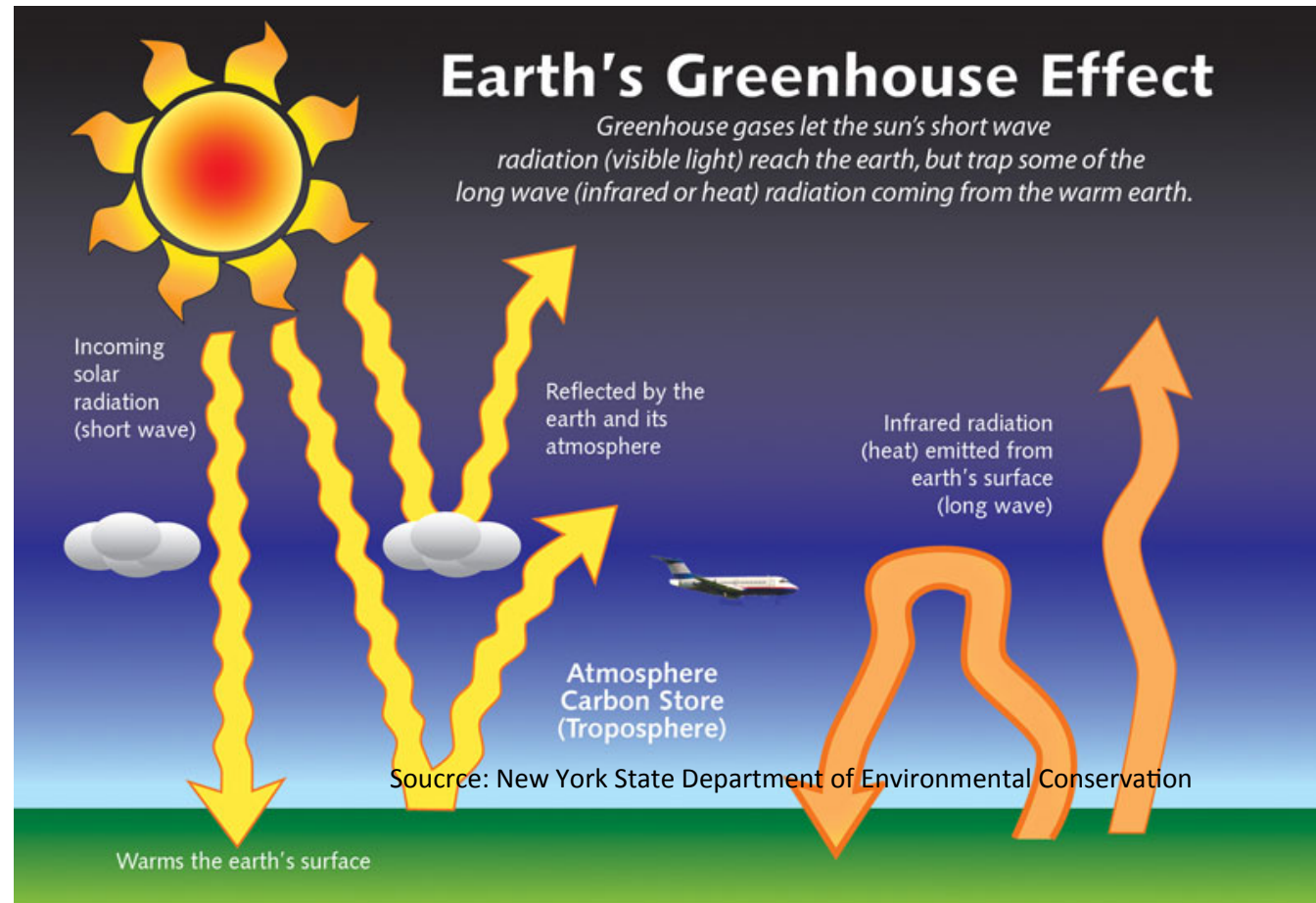
Figure 1. Shares of global anthropogenic GHG, 2010



How Do We Know The Climate is Changing?

- Explanations:

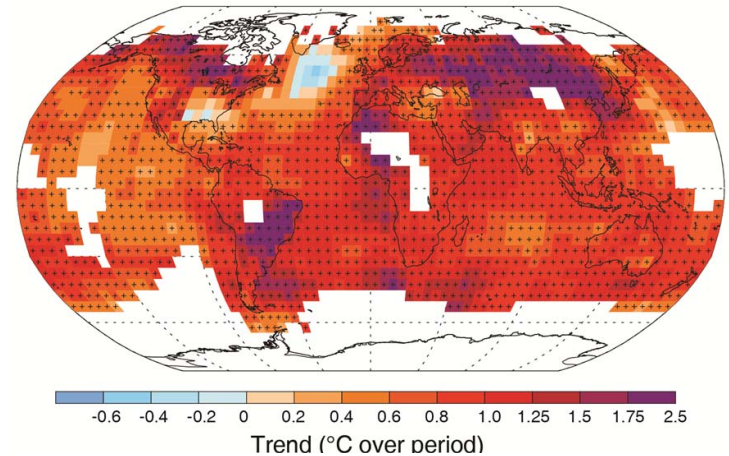
- The Greenhouse Effect
- Solar Variation
- Aerosols
- Albedo changes



What is Climate Change ?

- Temperature rise (Global Warming)
- Precipitation changes
- Ocean acidification
- Ice-cover changes
- Sea-level rise

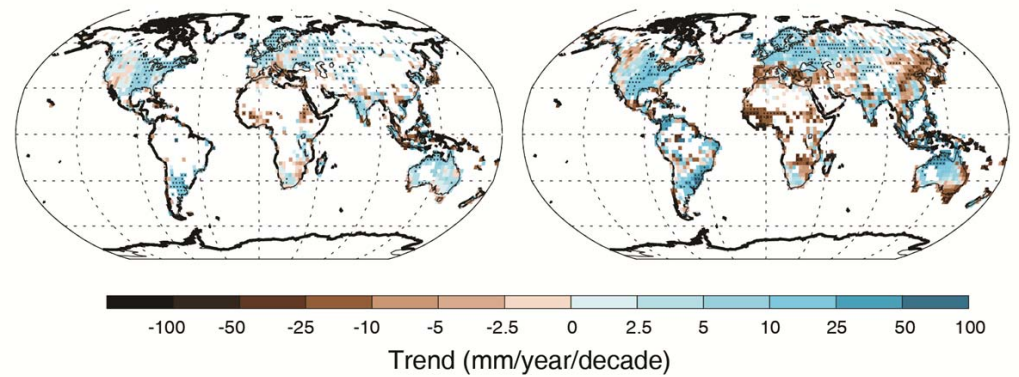
Observed change in average surface temperature 1901–2012



Observed change in precipitation over land

1901–2010

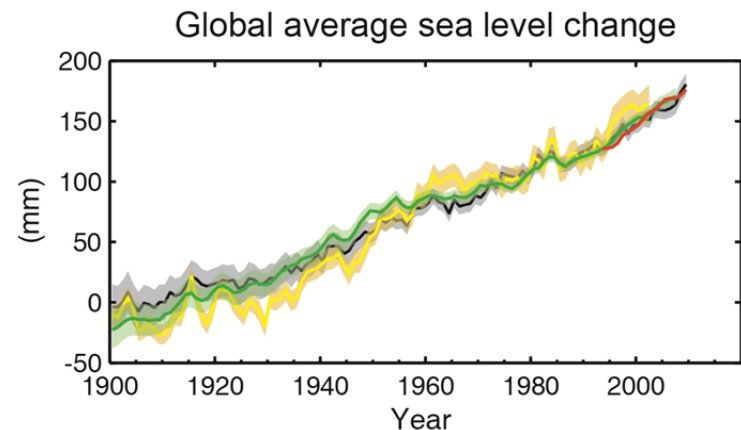
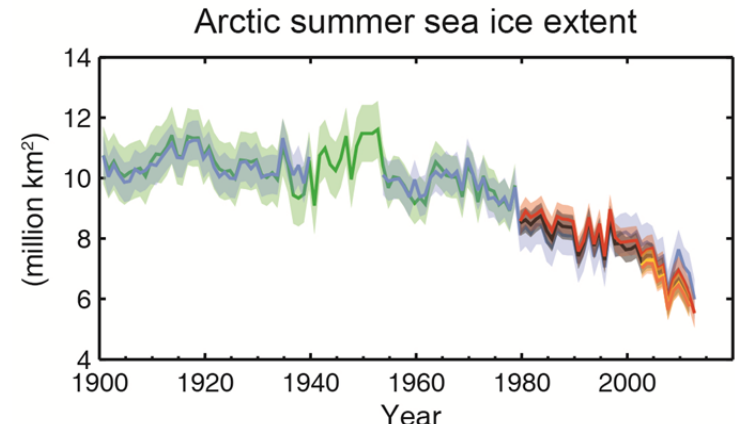
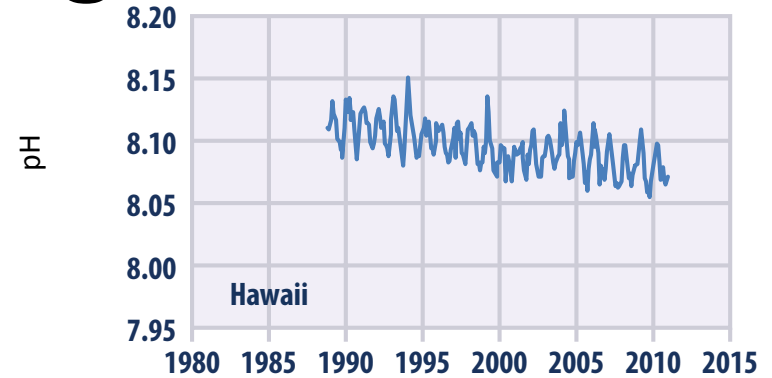
1951–2010



Source: IPCC-5 Summary for Policymakers

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Sources:

Top: Environmental Protection Administration

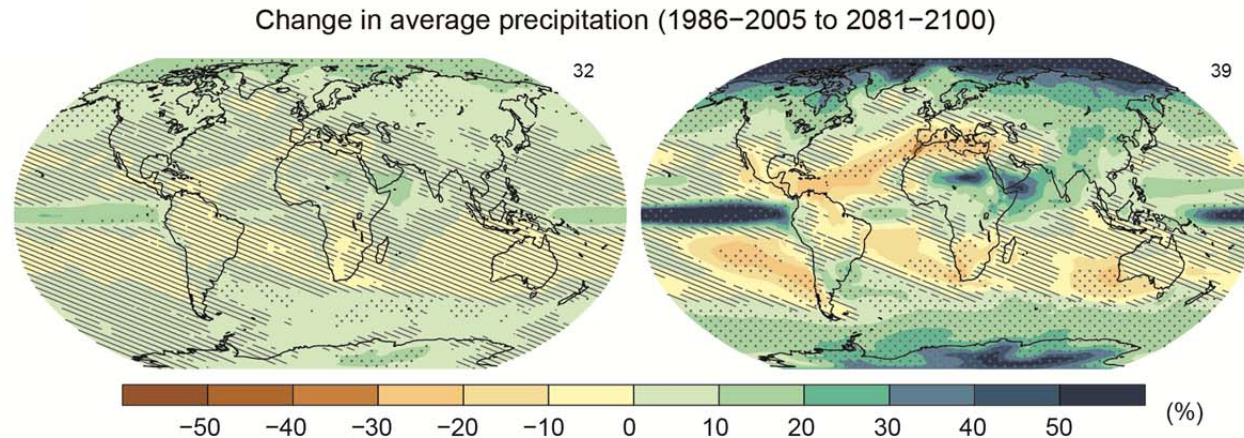
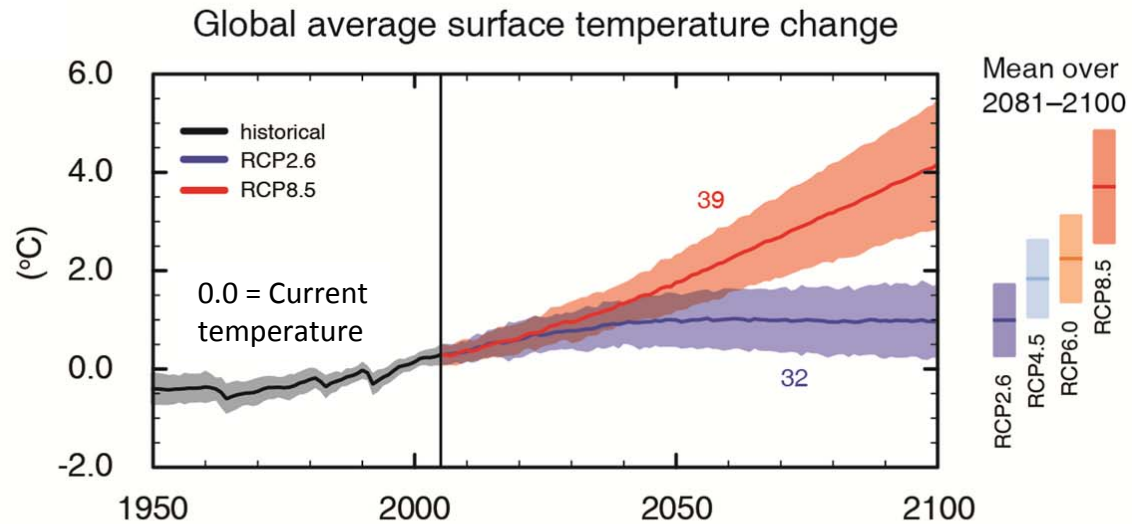
Middle and Bottom: PCC-5 Summary for Policymakers

How Do We Know The Climate is Changing?

- Empirical evidence: How good is it?
 - Temperature: **virtually certain**
 - Precipitation: **medium confidence**
 - Ocean acidification **high confidence**
 - Decreasing ice **very likely (Greenland) to likely (Antarctica)**
 - Sea-level **very likely**

What do We Expect Worldwide?

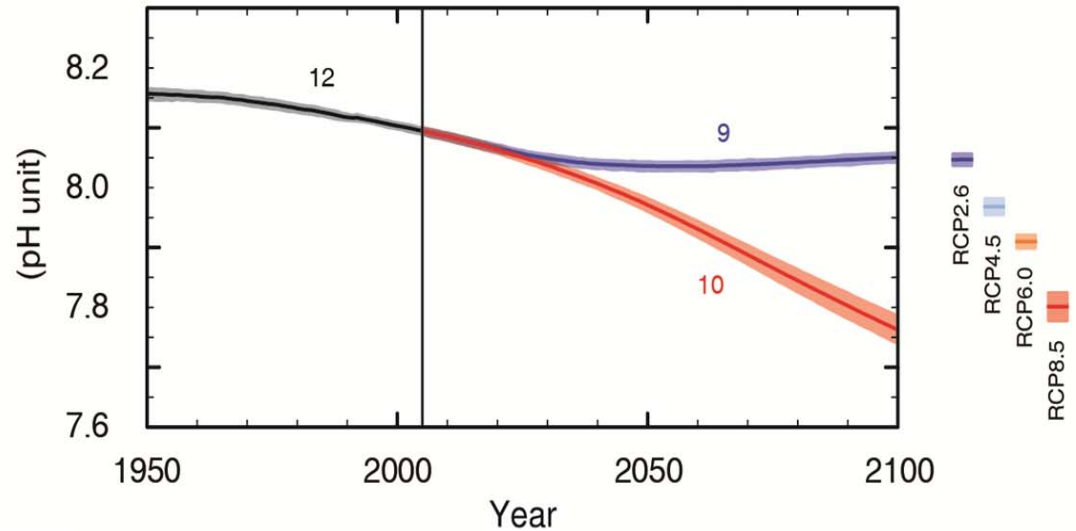
- Values and ranges of uncertainty
 - Temperature rise (Global Warming)
 - Precipitation changes
 - Ocean acidification
 - Ice-cover changes
 - Sea-level rise



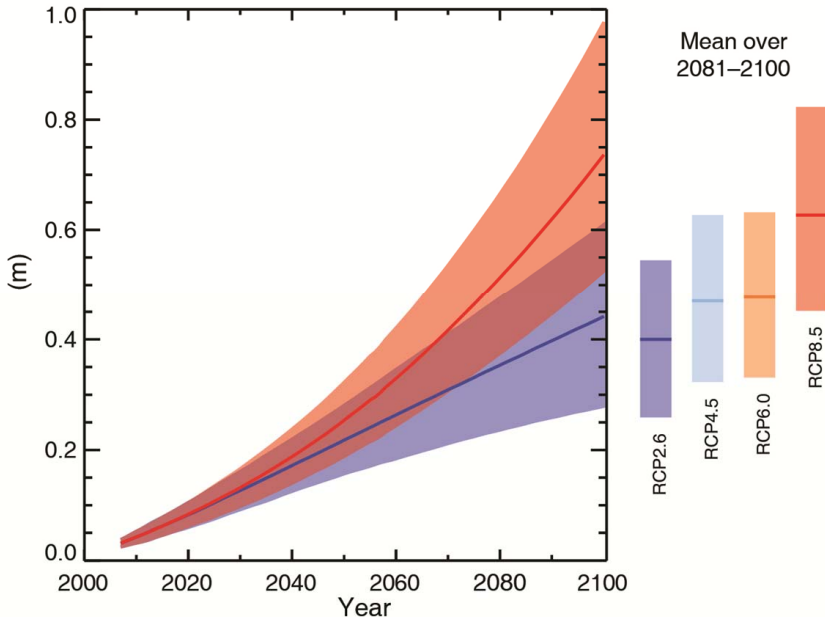
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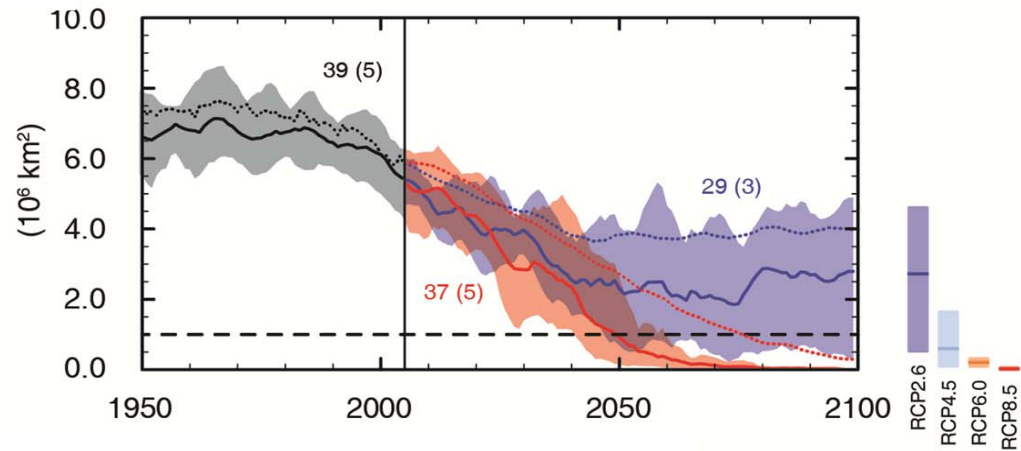
Global ocean surface pH



Global mean sea level rise



Northern Hemisphere September sea ice extent



How Do We Know The Climate is Changing?

- Science and probability
- Uncertainty
- The misunderstanding of uncertainty
- The manipulation of uncertainty

Who denies climate change and why

- At first: skeptical scientists (wanted evidence)
- Corporations who will benefit from continued status quo
- People with an innate sense of distrust (see institutions chapters of *Strangers*)
- Politicians who
 - Benefit from Contributions
 - Need votes from people who distrust institutions

Stages of Denial and Manipulation of Uncertainty

1. It's not happening (the holocene and the hiatus: misunderstanding of uncertainty)
2. It's happening, but it's due to natural variation (misunderstanding of statistical history)
3. It's happening and humans may have something to do with it but
 - a. It's too expensive
 - b. We can live with it

Stages of Denial and Manipulation of Uncertainty

1. It's not happening (the holocene and the hiatus: intentional misunderstanding of uncertainty)

CO2 levels are today, among the lowest in the past 600 million years.

CO2 levels were higher than today in 85% of the past 600 million years.

CO2 levels were as much as 20 times higher in the geological past.

CO2 levels were at least 5 times higher than today in the dinosaur period.

There were three ice ages with more CO2 than today, one had fifteen times more.

CO2 has never been observed in the geological record to be a driver of the climate, even when levels were significantly higher than today.

CO2, by itself, can not cause much warming. For there to be dangerous warming, other things must occur, which would accelerate the warming, called positive feedbacks. The most likely is increased atmospheric water vapor. Positive feedbacks have not been observed to exist in the past and when CO2 levels were significantly higher than today. Atmospheric humidity is also actually in decline. [link](#)

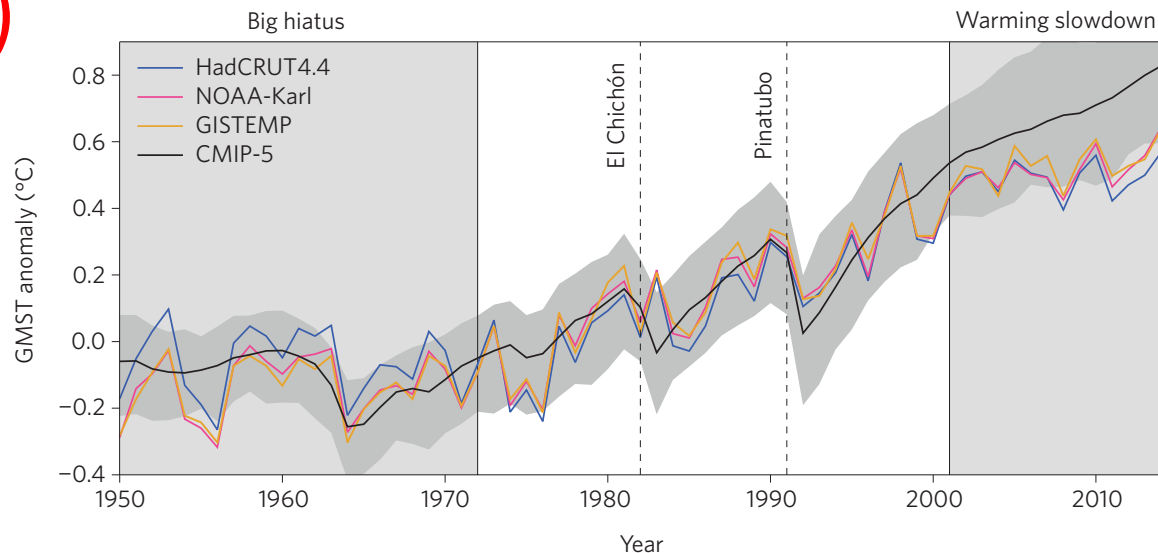
Global temperatures were mostly warmer than today in the prior 8,000 years, the Holocene.

[link](#)

[What Breitbart has to say](#)

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How Do We Decide What to Do?

- Uncertainty and [Precaution](#)
- Uncertainty and Discounting
- Uncertainty and Manipulation