

# THE ANTHROPOCENE















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# U.S. POPULATION

317 million

# China POPULATION

1.36 billion

# India POPULATION

1.24 billion



## U.S. POPULATION

317 million

Middle class: 210 million

## China POPULATION

1.36 billion

Middle class: 150 million

## India POPULATION

1.24 billion

Middle class: 50 million

# SOCIAL SCIENCE FOR EVERYONE

What can social science contribute to the well being of all populations and groups globally?



Are there methods of environmental integration instead of extraction practiced by other populations?



# A Different Angle on 'Climate Change'



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We are NOT  
destroying  
the planet



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# A Different Angle on 'Climate Change'

- There is no **equilibrium** or **homeostatic** manner in which the planet Earth is “supposed to be.” It is a dynamic system.
- However, there are the conditions of the planet which have been very favorable to humankind, allowing us to propagate rapidly and globally.
- Saying things like we (humans) are “destroying the planet” implies that there is a state in which the Earth is supposed to remain. This is ludicrous – we cannot destroy something with a mass of  $5.9722 \times 10^{24}$  kilograms.

# A Different Angle on 'Climate Change'

**However, we CAN (and might) permanently destroy the conditions within which our species is capable of reproducing itself.**

# A Different Angle on 'Climate Change'

However, we CAN (and might) permanently destroy the conditions within which our species exists.

Trust me. We aren't going to 'destroy' the planet. But, we might make it impossible for humans to inhabit.



# Exploitation & Extraction

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# Exploitation & Extraction

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- We are thus living off Earth’s accumulated natural capital.
- We use more arable soil and dead carbon annually than the Earth produces in a year.
- “Fortunately,” the earth has been accumulating soil and carbon for millions of years, so there are some reserves, but we are eating into them.

# Resource Depletion

- Human population risen tenfold in the past 300 years. About a billion people every 12 years.
- Global cattle population is 1.4 billion.
- Approximately 1kg of concrete has been produced for every square meter of the Earth's surface.
- How long will plastics and styrofoam take to decay. We have no idea, because none of it ever has!

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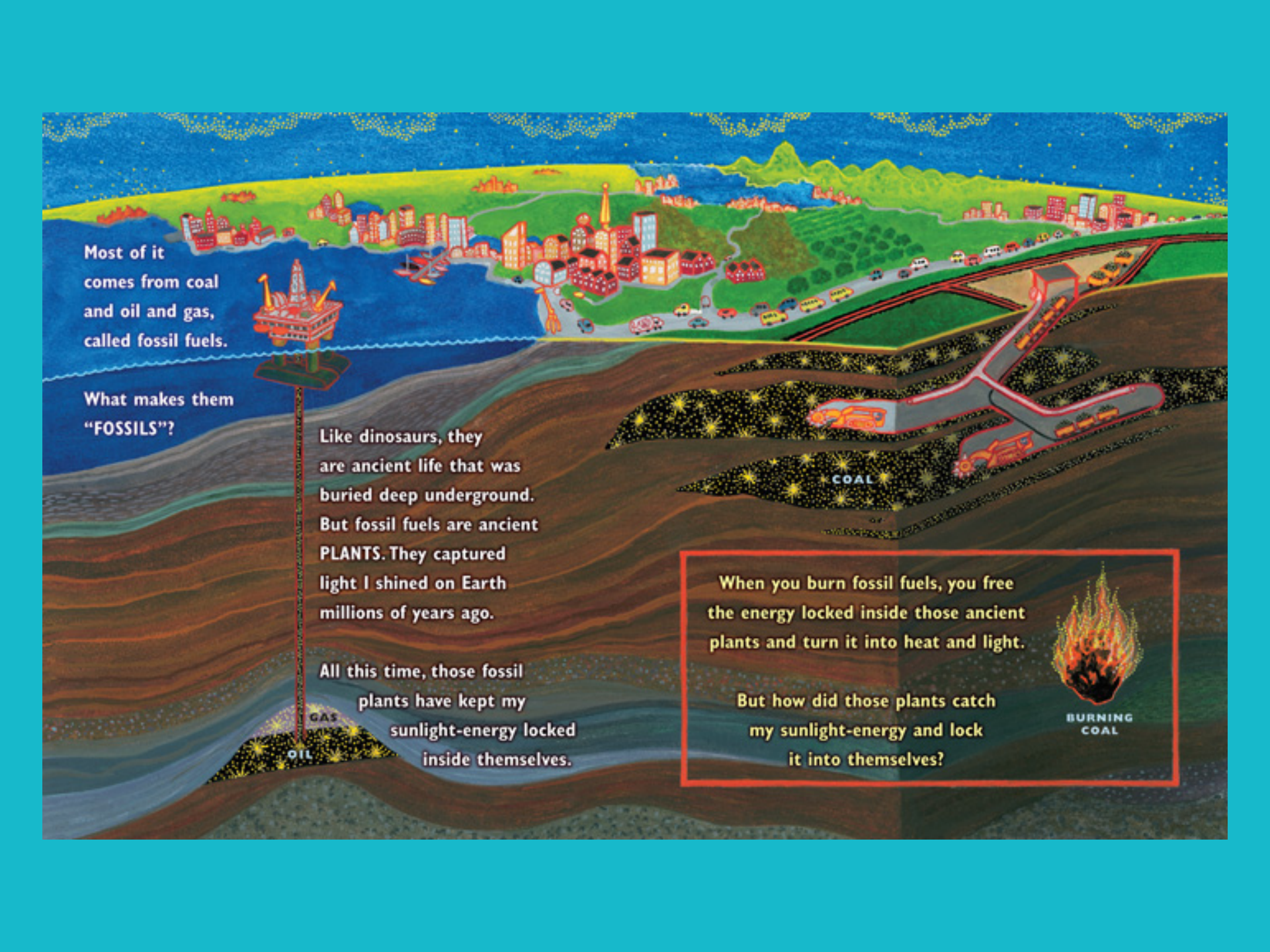
**Say, what are fossil fuels anyway?**

# Exploitation & Extraction

- In a couple generations we've used hundreds of millions of years of fossil fuel build up.

**Say, what are fossil fuels anyway?**

**Buried Sunlight!**



Most of it  
comes from coal  
and oil and gas,  
called fossil fuels.

What makes them  
"FOSSILS"?

Like dinosaurs, they  
are ancient life that was  
buried deep underground.  
But fossil fuels are ancient  
**PLANTS**. They captured  
light I shined on Earth  
millions of years ago.

All this time, those fossil  
plants have kept my  
sunlight-energy locked  
inside themselves.

When you burn fossil fuels, you free  
the energy locked inside those ancient  
plants and turn it into heat and light.

But how did those plants catch  
my sunlight-energy and lock  
it into themselves?





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What makes them

**ENERGY = DEAD CARBON**

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All this time, those fossil plants have kept my sunlight-energy locked inside themselves.

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GAS  
OIL

COAL

# Kinds of Resources

Provisioning goods and services:

resources, food, water, fossil fuels, metals

Supporting services:

soil formation, nutrient cycling

Regulating services:

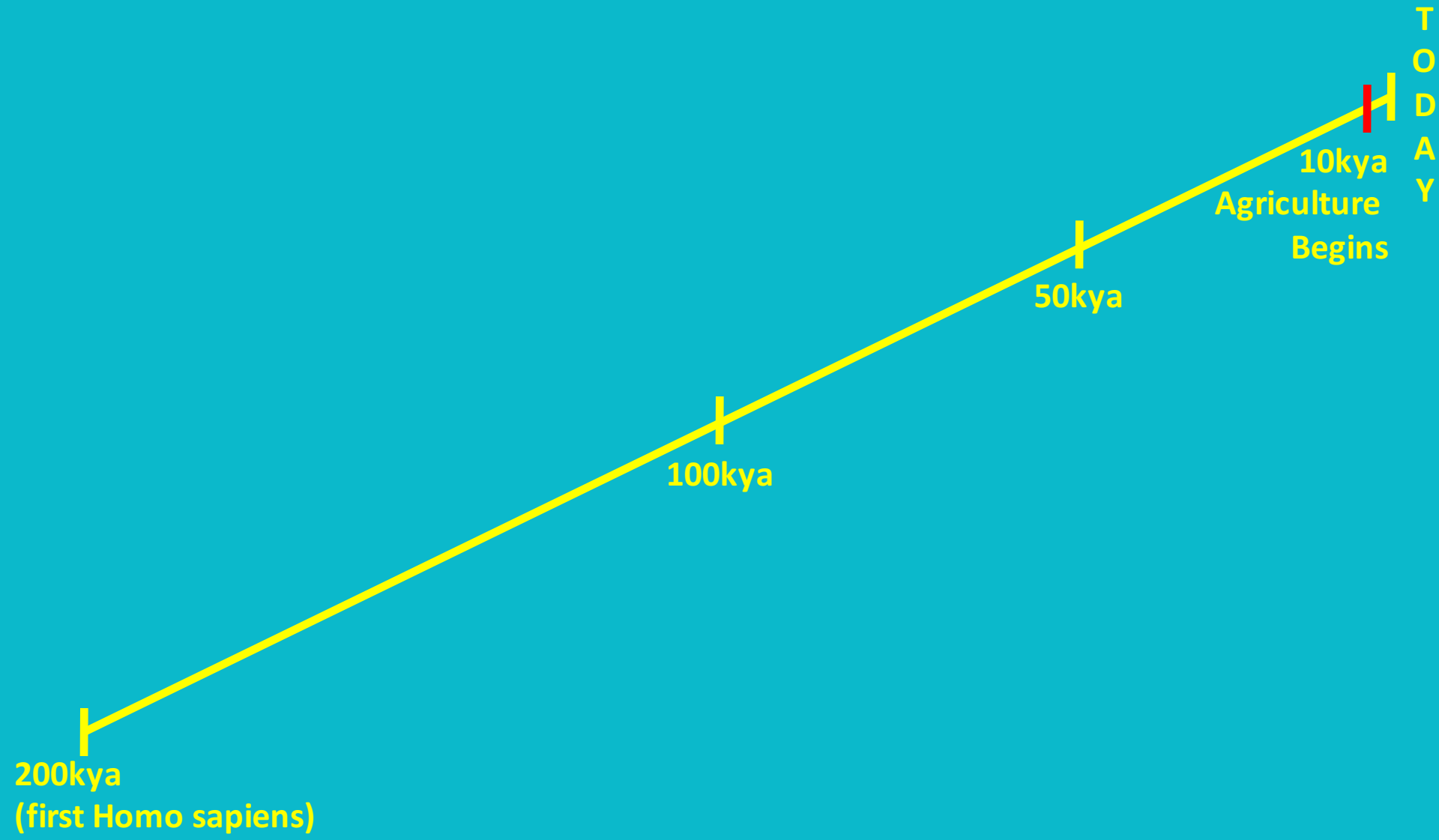
control of pests and diseases and  
temperature.

# Timeline of human resource manipulation

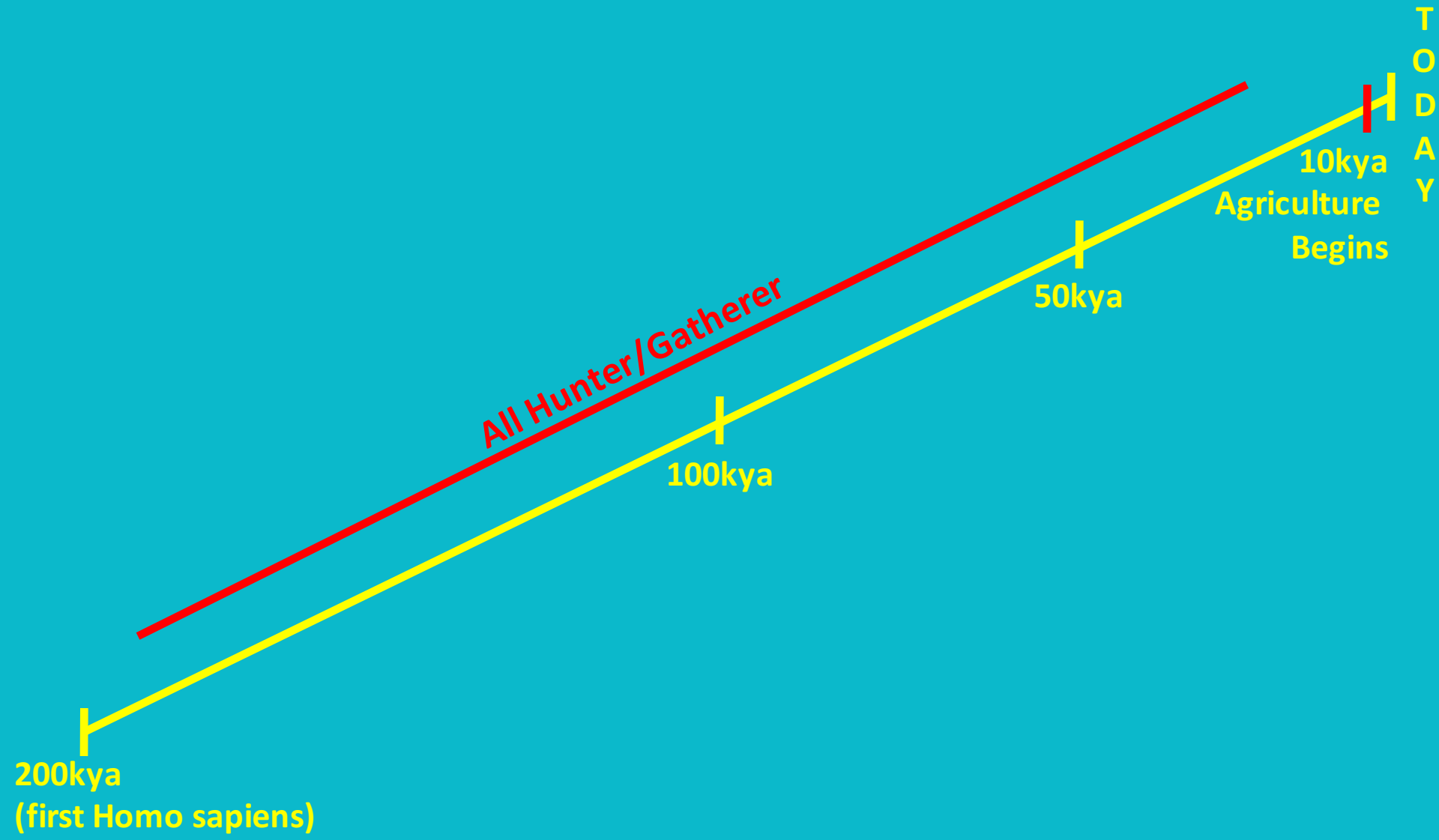
The first 90% of humanity's duration on this planet we were Hunters & Gatherers.

Only in the past 10% have we engaged in large scale environmental rearrangement.

# Timeline of human resource manipulation

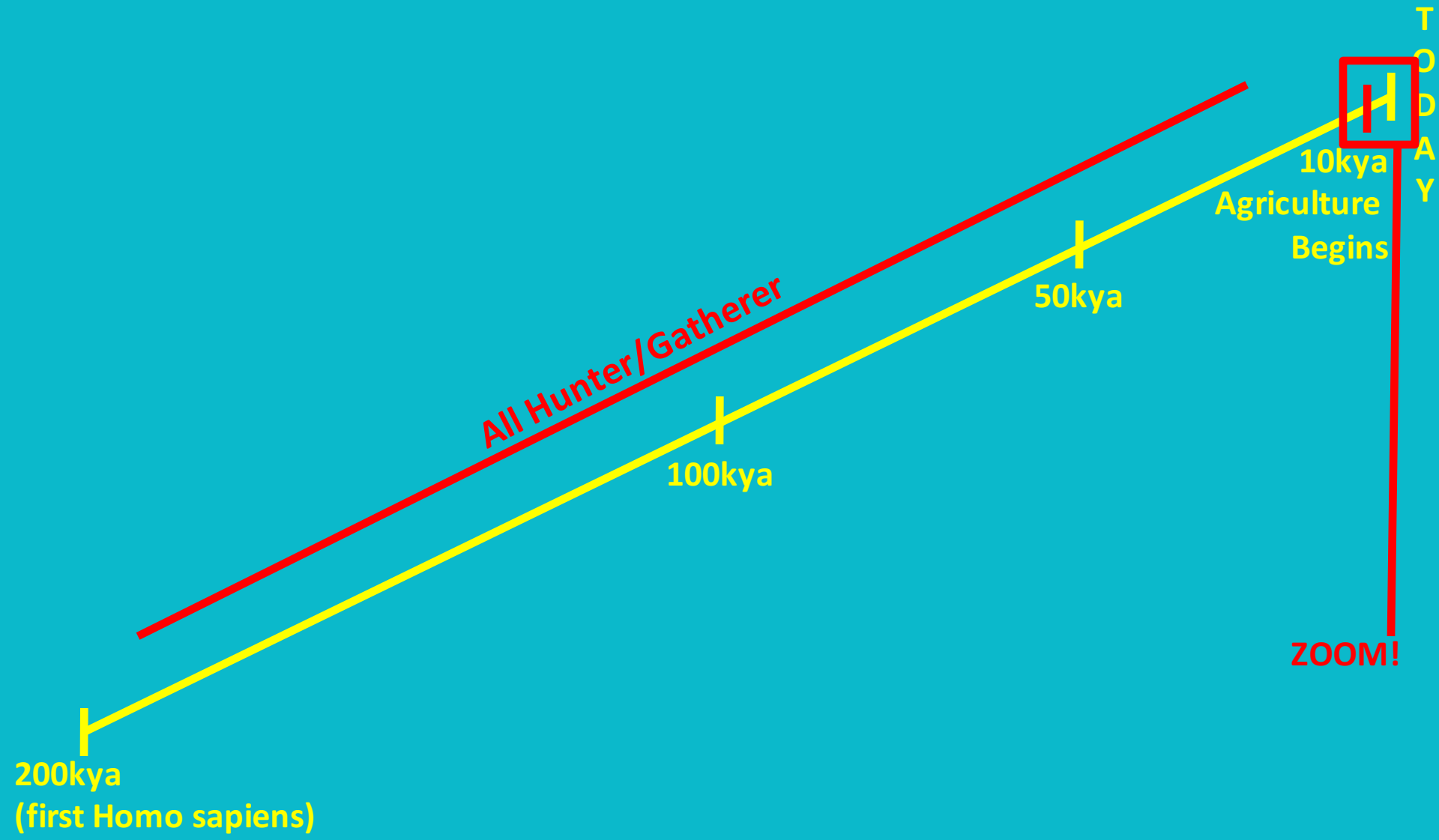


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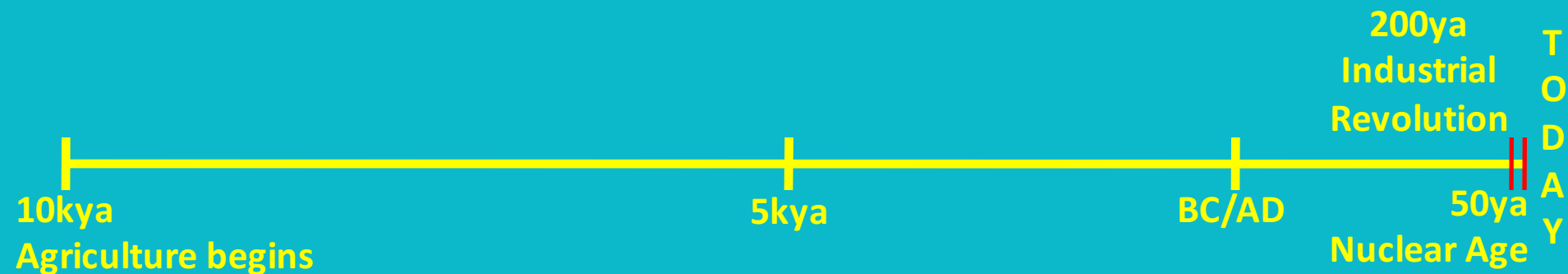




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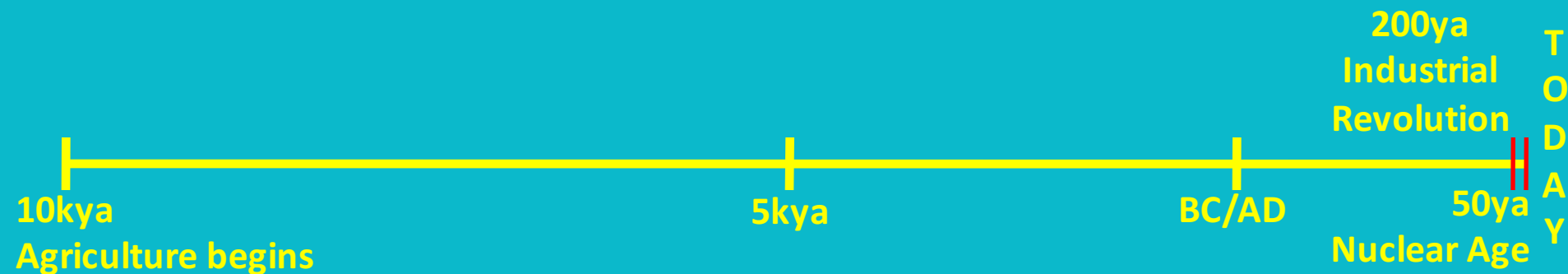


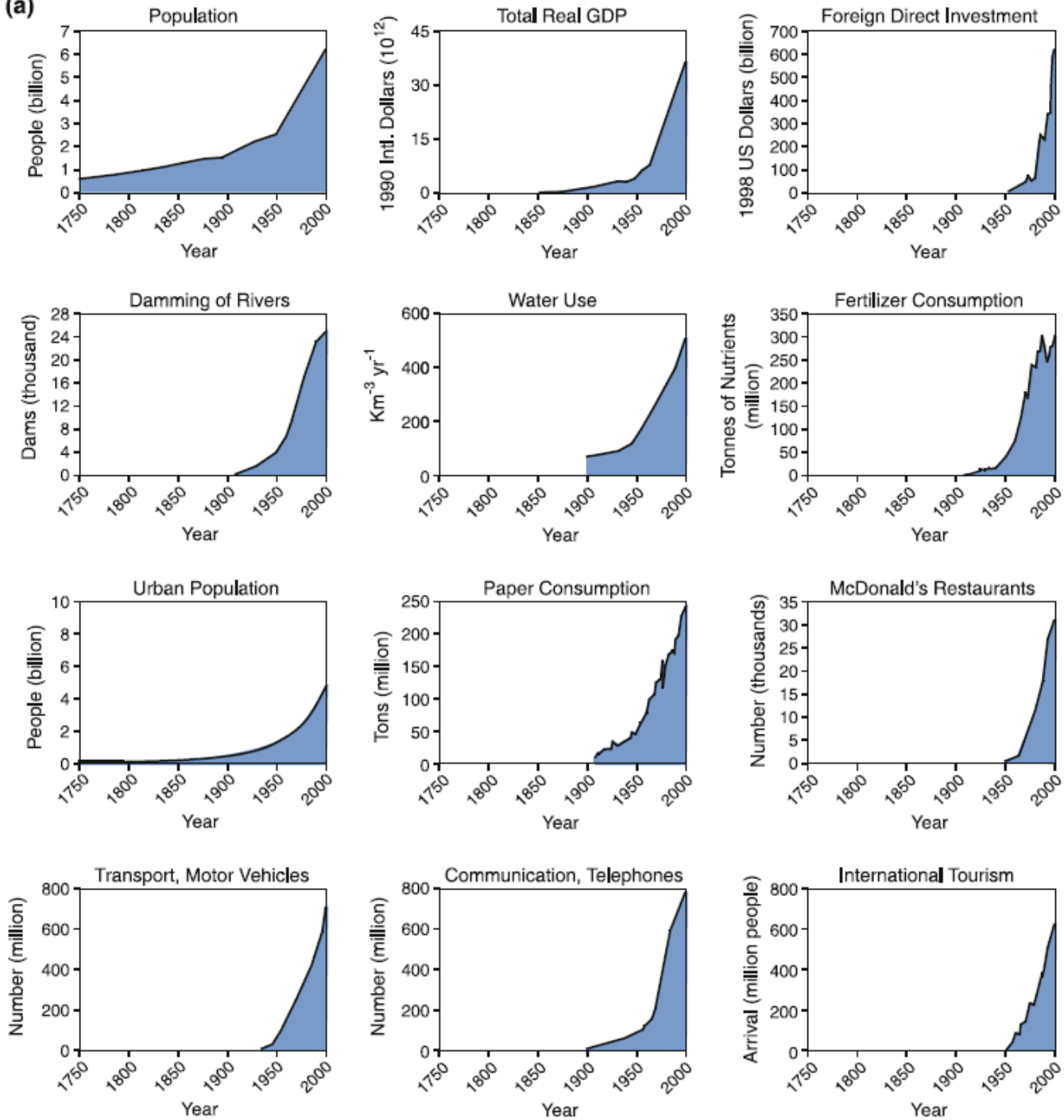
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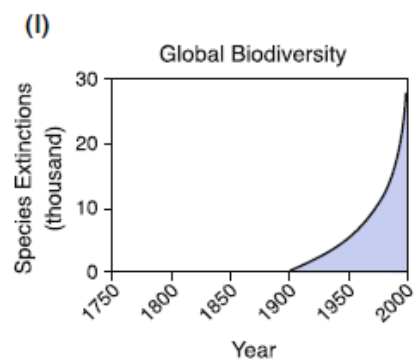
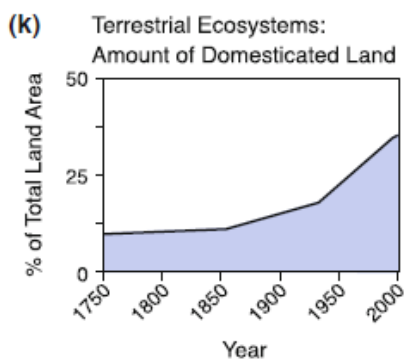
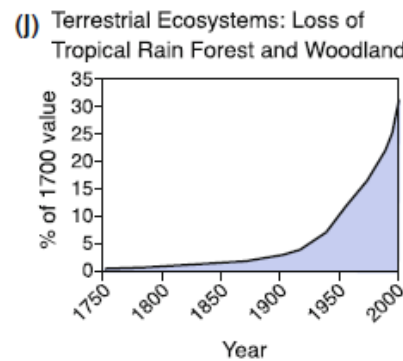
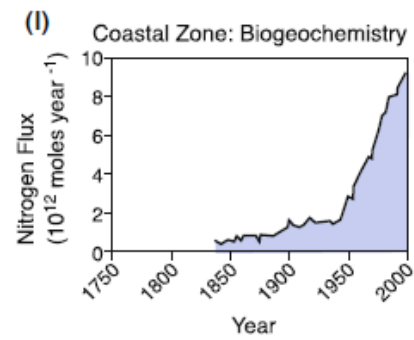
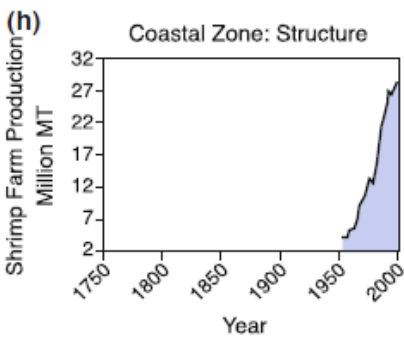
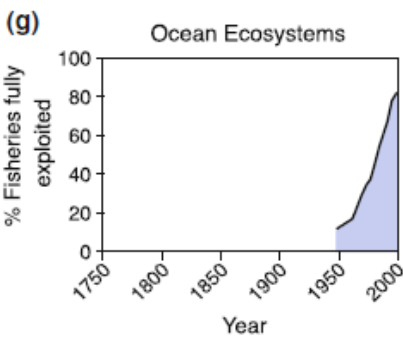
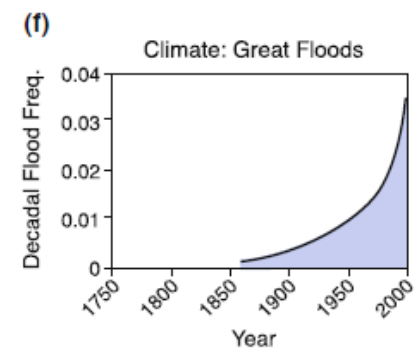
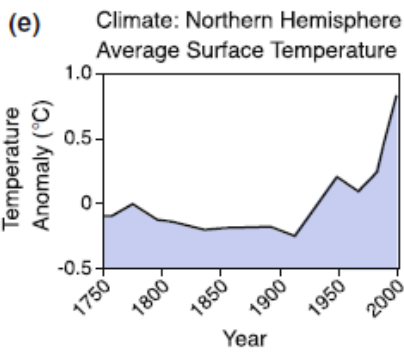
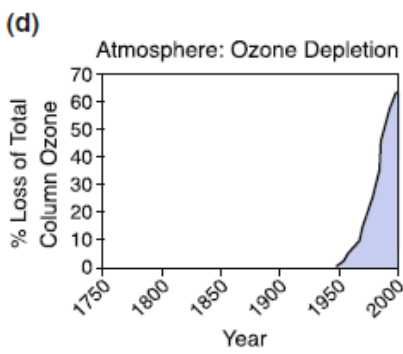
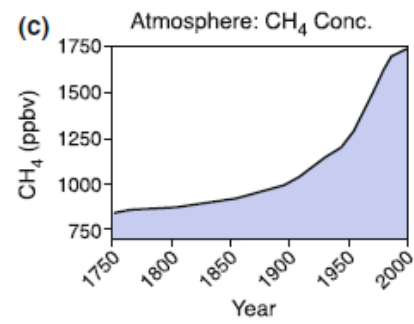
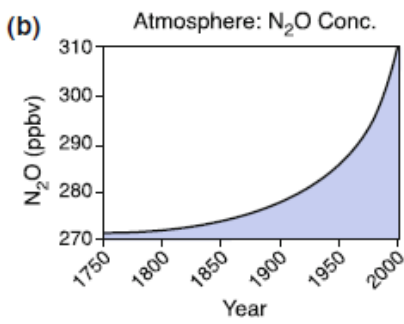
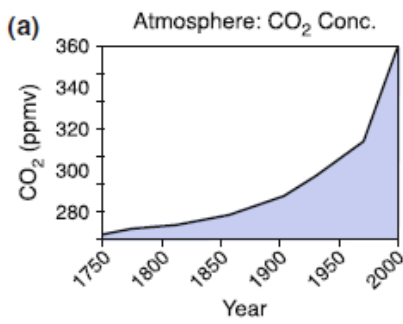


# Timeline of human resource manipulation

**Great Accelerations!**

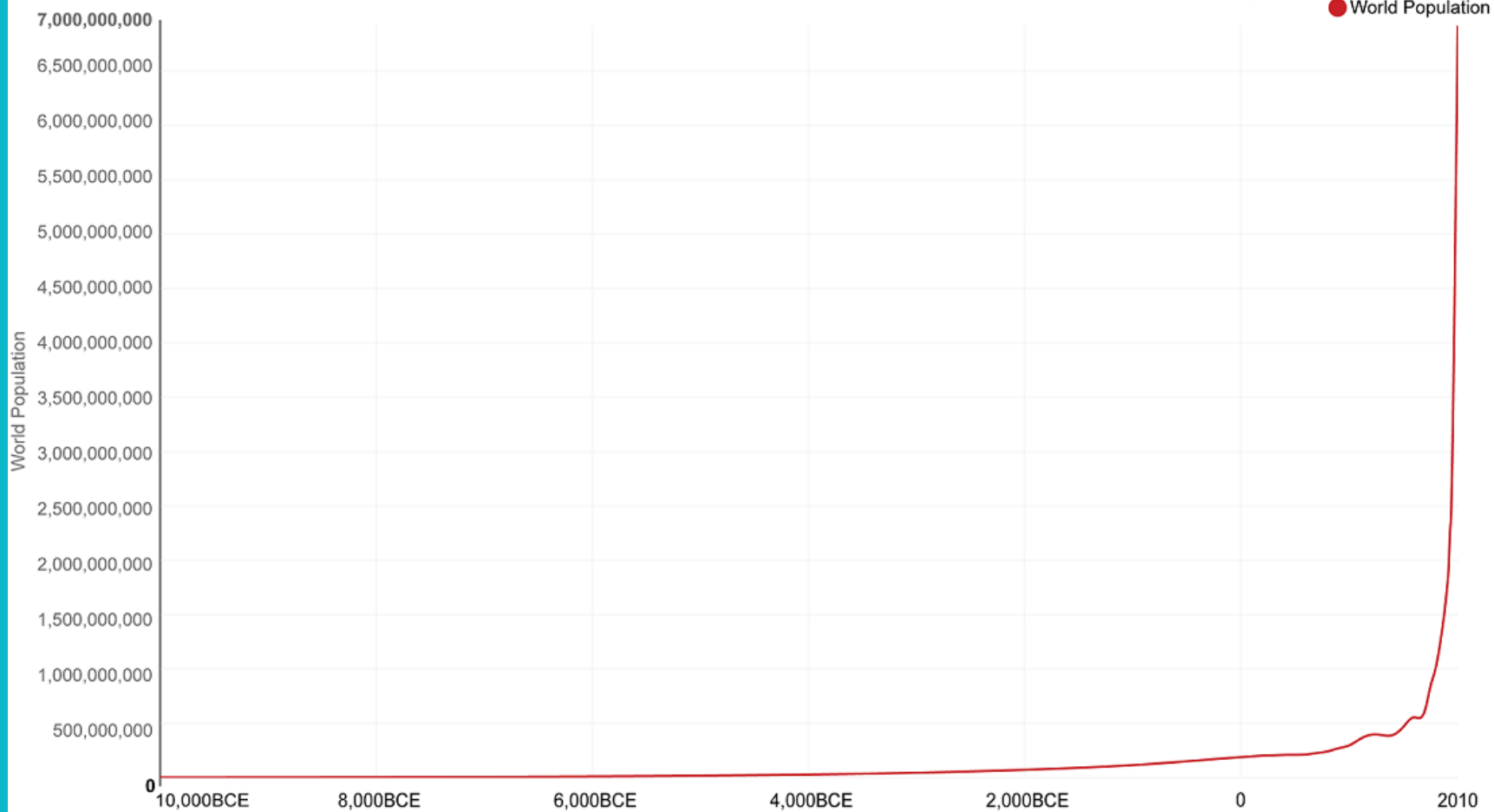


**(a)**





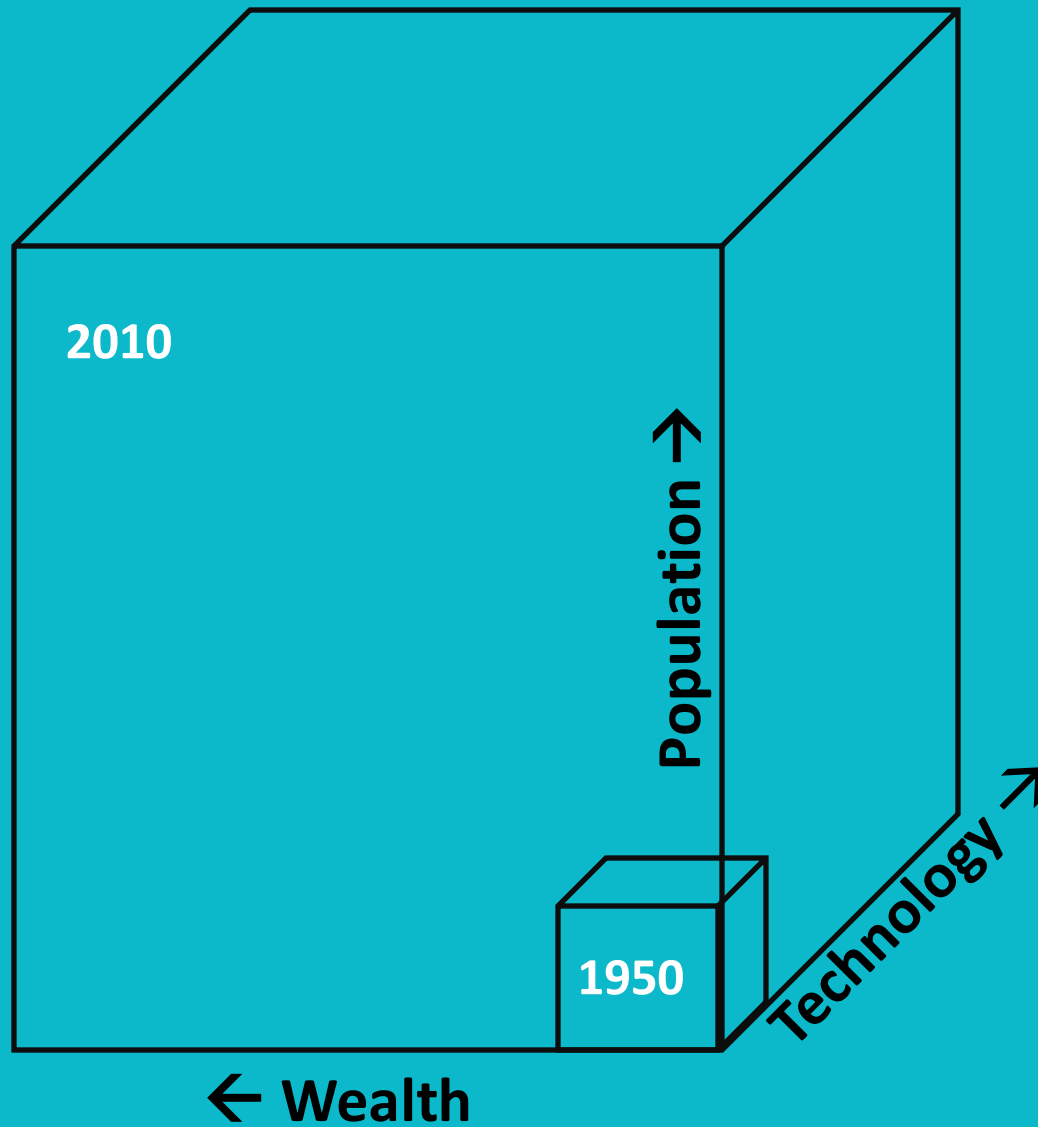
The data is available for download here at: [www.ourworldindata.org/data/population-growth-vital-statistics/world-population-growth](http://www.ourworldindata.org/data/population-growth-vital-statistics/world-population-growth)

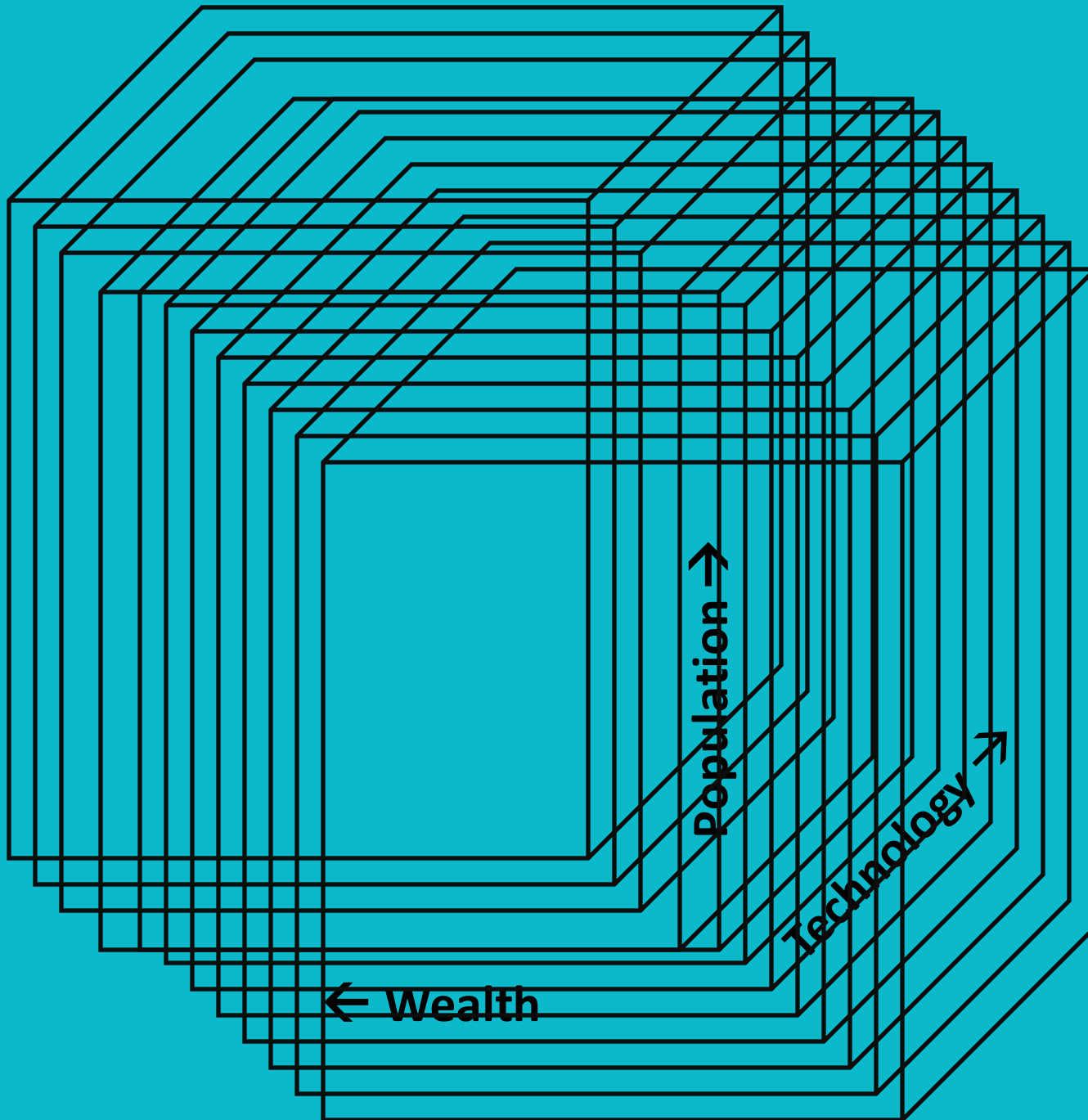


Data source: OurWorldInData.org

The interactive data visualization is available at [OurWorldinData.org](http://OurWorldinData.org). There you find the raw data and more visualizations on this topic.

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# The Holocene: Steady State or Fortuitous transition?

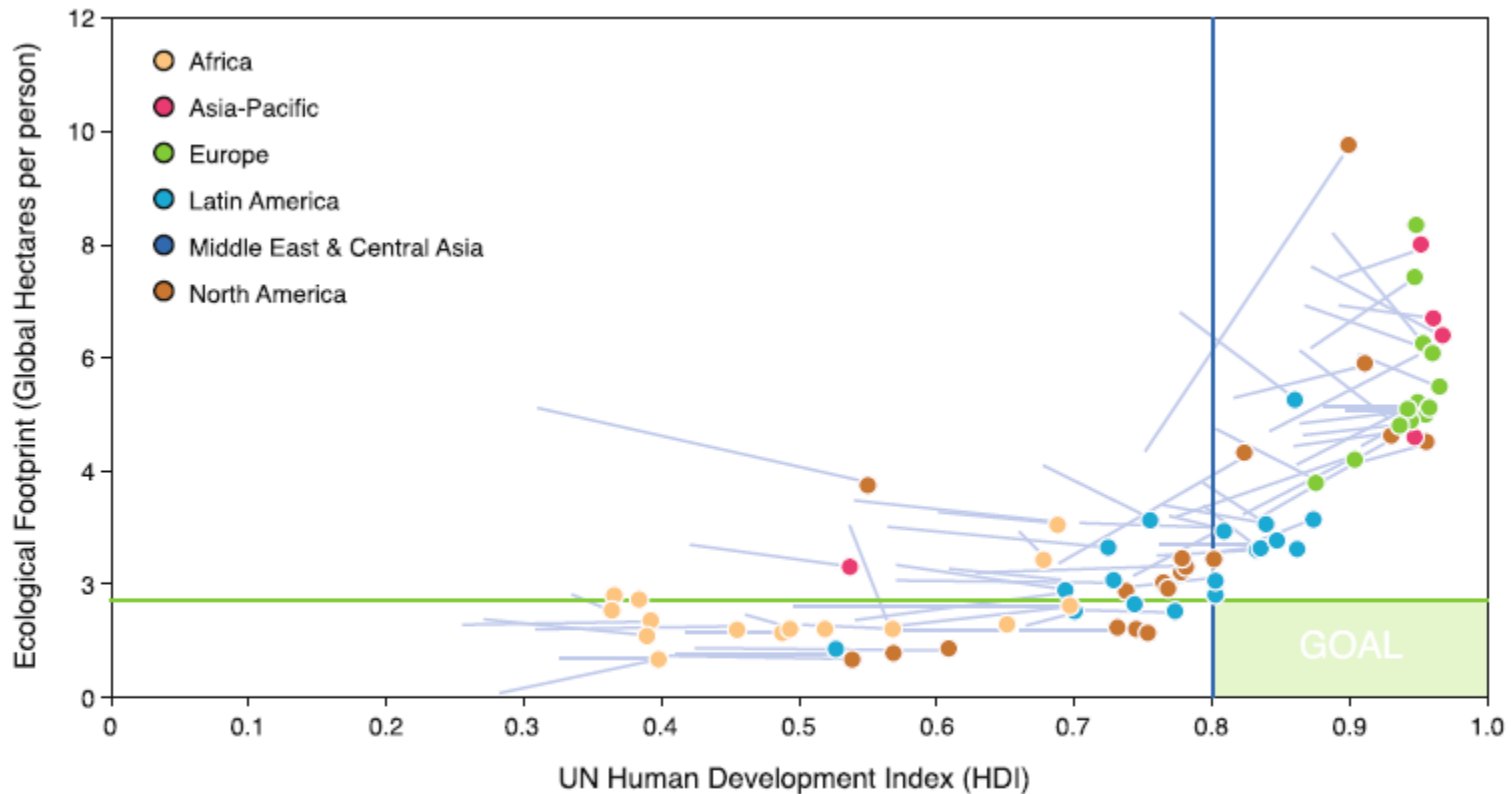


Fig. 6 National Human Development Index and Ecological Footprint trajectories, 1980–2007, compared with goal levels. (Global Footprint Network 2011) (see flash video at [http://www.footprintnetwork.org/en/index.php/GFN/page/fighting\\_poverty\\_our\\_human\\_development\\_initiative/](http://www.footprintnetwork.org/en/index.php/GFN/page/fighting_poverty_our_human_development_initiative/))

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# Responses to Environmental Pressures

## Collapse

Disappearance of a culture and its accumulated resources

## Migration

Movement of a population to a new region of resource exploitation

## Creative Invention

Generation of more efficient methods of extracting environmental resources



# EXTINCTION?

## Five Great Extinctions:

One) 66 mya = 75% species disappearance

Two) 201 mya = 70% species disappearance

Three) 252 mya = 90% species disappearance

Four) 360 mya = 70% species disappearance

Five) 440 mya = 60% species disappearance

# EXTINCTION?

## Five Great Extinctions:

**Today? Zero million years ago:**

- 7% of species gone?
- 140,000 species per year?
- 10,000 times the baseline extinction rate?

# EXTINCTION?

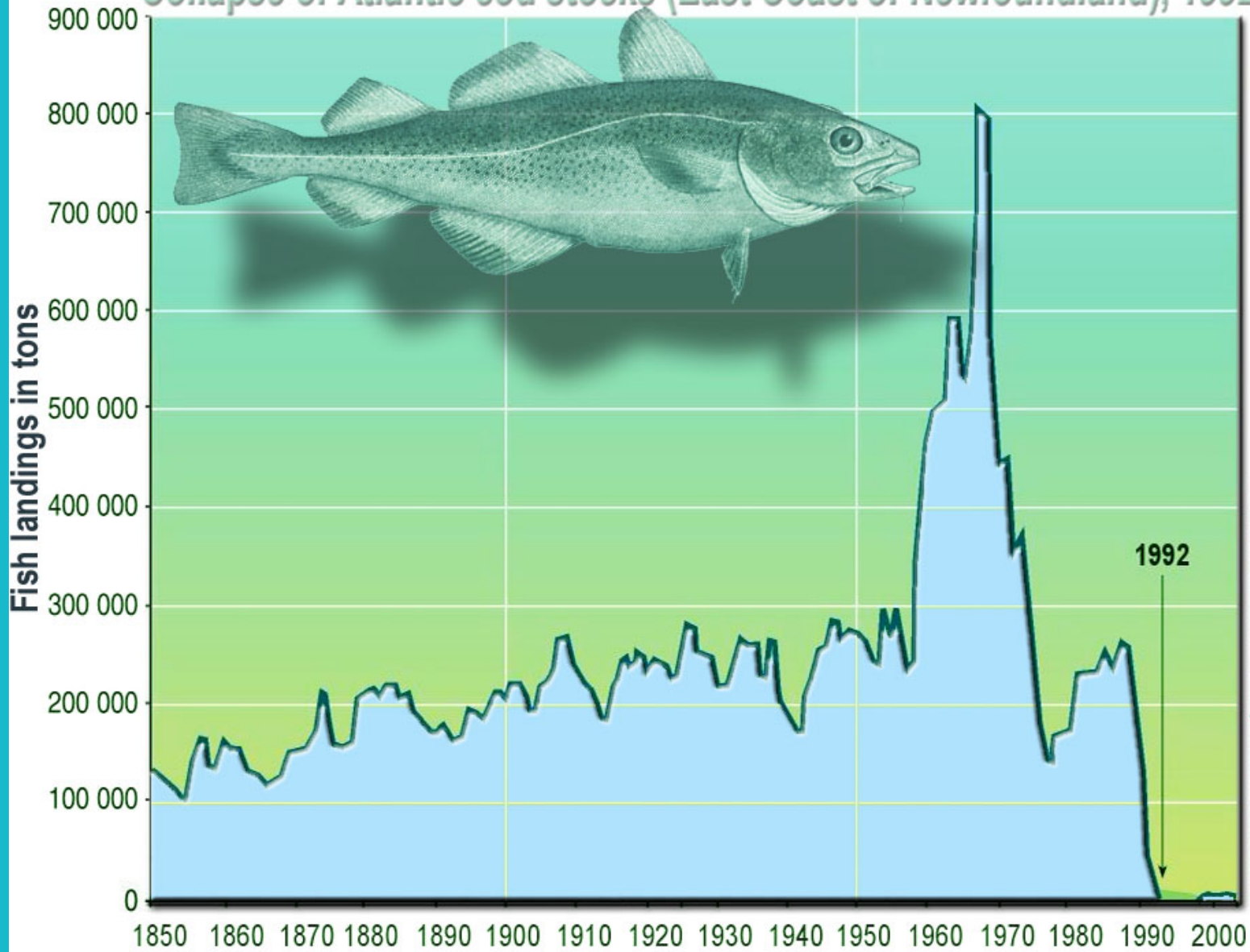
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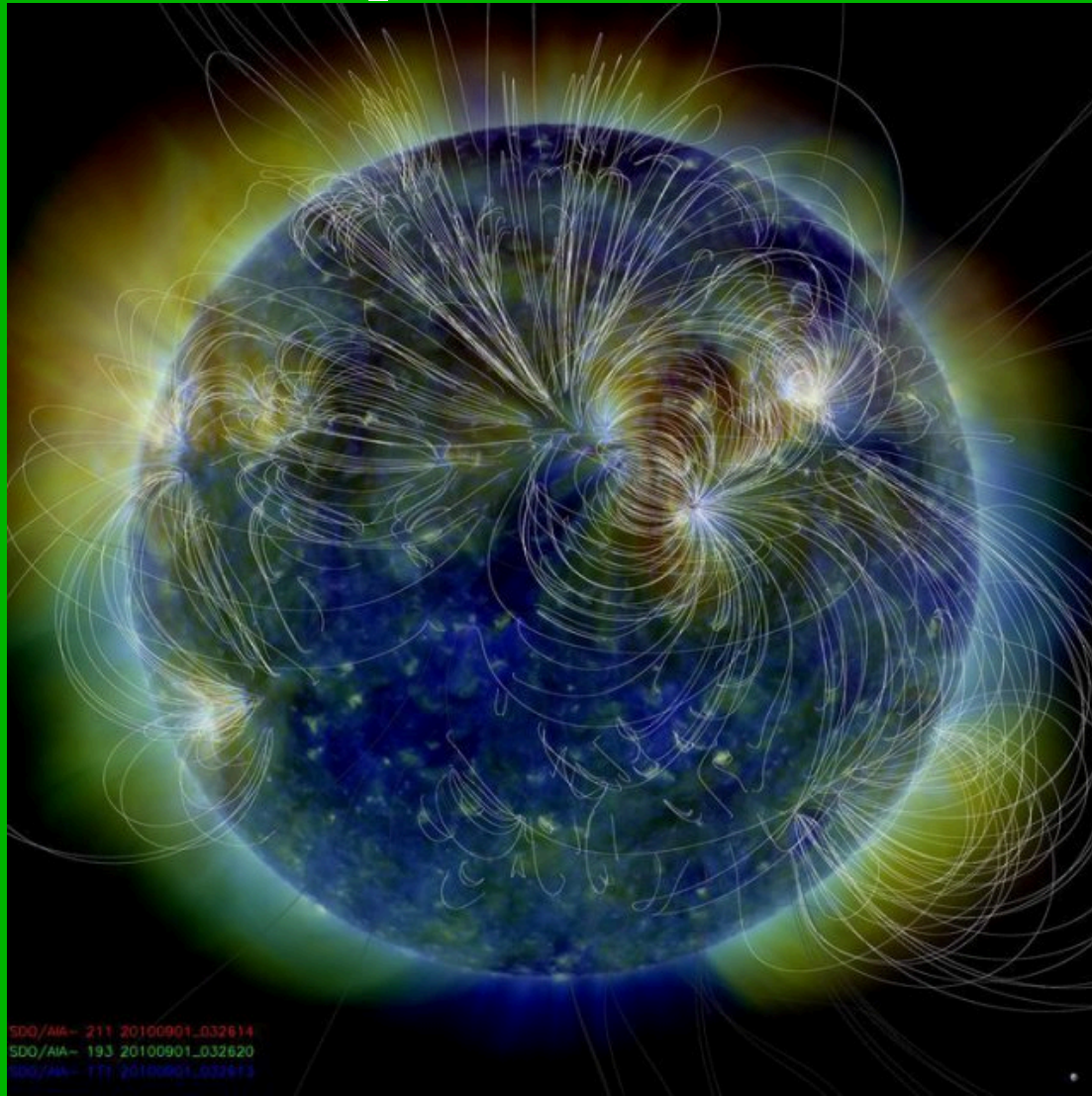
**6<sup>th</sup> Great Extinction?**

# Collapse of Atlantic cod stocks (East Coast of Newfoundland), 1992.



Source : Millennium Ecosystems Assessment

# noösphere v. the anthropocene



SDO/AIA - 211 20100901\_032614  
SDO/AIA - 193 20100901\_032620  
SDO/AIA - 171 20100901\_032614



# noösphere v. the anthropocene

noösphere: the sphere of human thought.

- Like the 'atmosphere' or 'biosphere'
- Includes social phenomena – religion, politics, technology
- Will the dynamic creativity of this noösphere be able to overcome severe ecological changes? Or is the noösphere responsible for them?

# ***SILENT SPRING*** *(Rachel Carson)*





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## **THE ANTHROPOCENE:**

**Yes, it's a little self-indulgent, but the peculiarity of human behavior is rather noteworthy.**

# ***SILENT SPRING*** *(Rachel Carson)*

- **Considering the whole lifespan of the earth, the time in which life actually modifies its surroundings has been relatively slight (as opposed to the environment altering life).**
- **“Man can hardly recognize the devils of his own creation.” -- the environmental insanity unleashed on the earth is highly complex, almost to the point of invisibility.**
- **“Given time -- millennia not years -- life adjusts, but in the modern world there is no time.”**

# ***SILENT SPRING*** *(Rachel Carson)*

- Considering the whole lifespan of the earth, the time in which life actually modifies its surroundings has been relatively slight (as opposed to the environment altering life).

- “Man can do it. He has the power, he has the technology, he has the velocity unleashed on the planet. He has the complexity, almost to the point of incomprehensibility.”

- “Given time -- millennia not years -- life adjusts, but in the modern world there is no time.”



# ***SILENT SPRING*** *(Rachel Carson)*

- “Radiation has always been around -- it’s in rocks, cosmic rays, the sun; but now it is the ‘unnatural’ creation of man’s tampering with the atom.”
- Man and all life is now asked to adjust to all sorts of synthetic chemicals that did not exist 200 years ago, let alone 200,000, 6 million or 4 billion years ago.

# ***SILENT SPRING*** *(Rachel Carson)*

- “500 new chemicals to which the bodies of humans and animals are required to adapt to each year, chemicals totally outside the limits of biologic experience.”
- Many of these chemicals are designed to get rid of insects (to produce higher yielding crops > see the story of corn > the rise of agriculture > the mandate for growth in contemporary economy).
- But these insects are ‘highly evolved’ with immunities to our chemical insecticides, hence deadlier and deadlier pesticides keep needing to be developed.

# ***SILENT SPRING*** *(Rachel Carson)*

- Often these insects have a resurgence after initial generations of spraying in numbers greater than before, thus the chemical war is never won, and all life is caught in this violent crossfire.
- Many chemicals (like radiation) bring about gene mutation. Humankind is determining its future by something as trivial as its choice of insect spray.
- All this risk for what? “how could ‘intelligent’ beings seek to control a few unwanted species by a method that contaminated the entire environment and brought the threat of disease to their own kind?”

# ***SILENT SPRING*** *(Rachel Carson)*

- We are told: “the expanding use of pesticides is necessary to maintain farm production.” Yet the real problem appears to be overproduction.
- “Under pre-industrial agricultural conditions farmers had few insect problems. These arose with intensification -- the devotion to intense acreages to a single crop. This allowed explosions of specific insect populations. Single crop farming does not take advantage of the principles by which nature works.”
- Nature introduced great variety into the landscape, but man has displayed a passion for simplification. Thus he undoes the built-in checks and balances by which nature holds a species within bounds.

# ***SILENT SPRING*** (Rachel Carson)

- We are told: “the expanding use of pesticides is necessary to maintain farm production.” Yet the real problem appears to be overproduction.
- “Under pre-industrial agricultural conditions farmers had few insecticides. Insects were kept in check by a complex system of natural checks and balances. Man does not take advantage of the principles by which nature works.”
- Nature introduced great variety into the landscape, but man has displayed a passion for simplification. Thus he undoes the built-in checks and balances by which nature holds a species within bounds.

**Can we tame nature?**

# ***SILENT SPRING*** *(Rachel Carson)*

**“Who wants to live in a world  
that is just quite not fatal?”**