



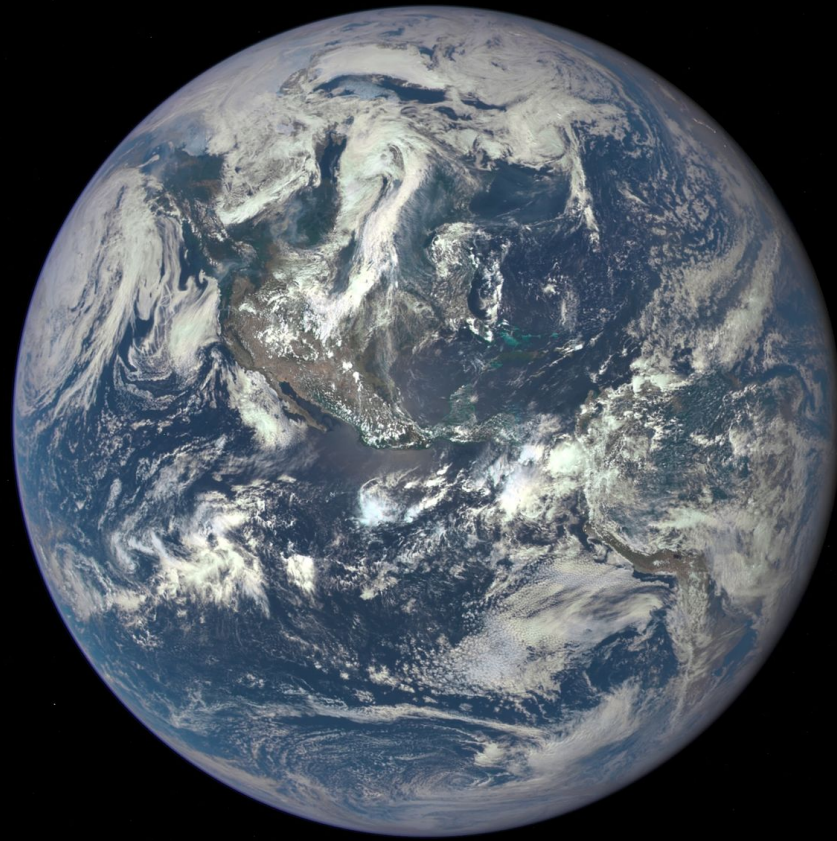
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of the European Union



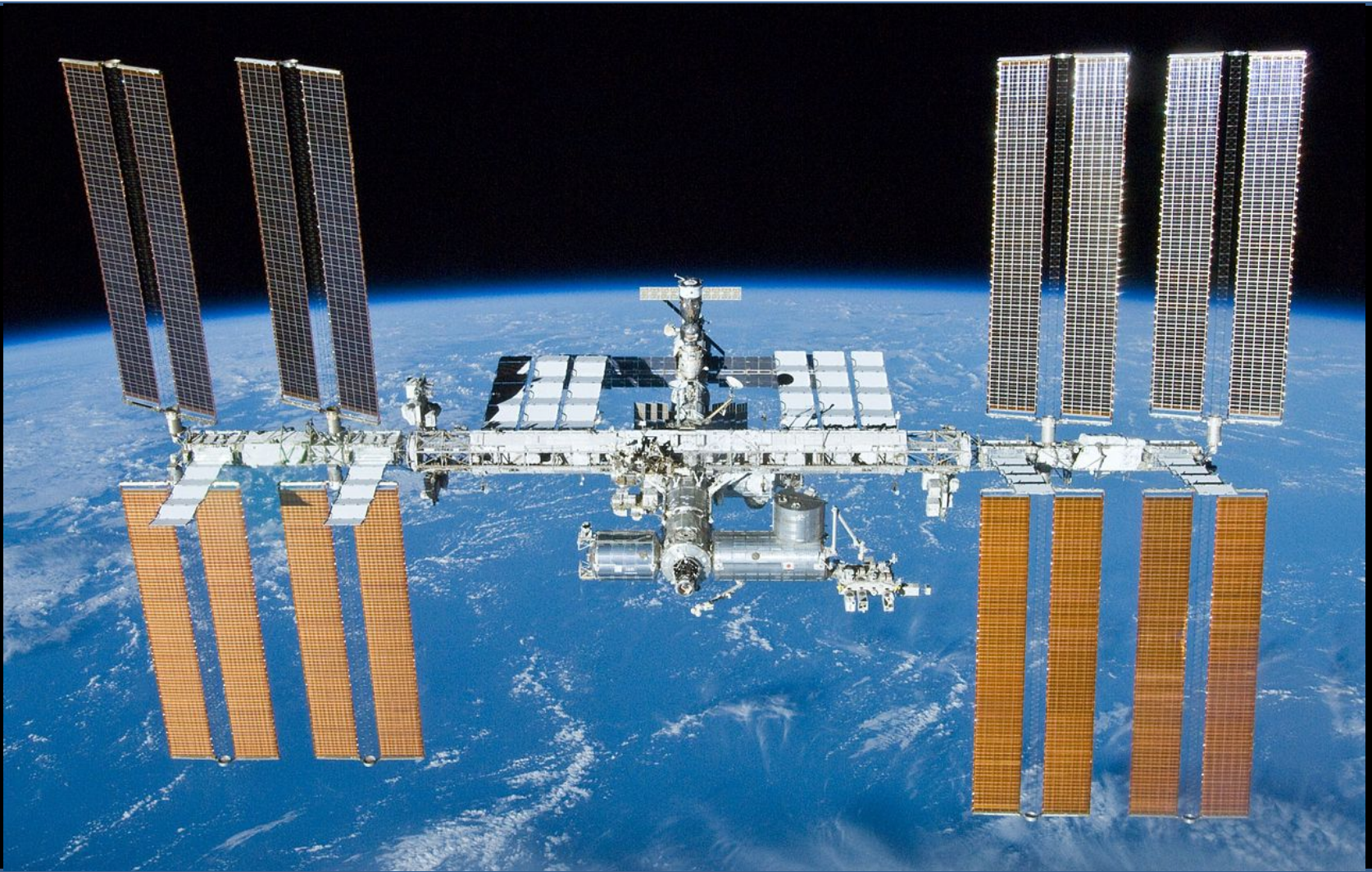
GLOBAL PRESSURES

We only have one planet

GLOBAL PRESSURES | ONE PLANET

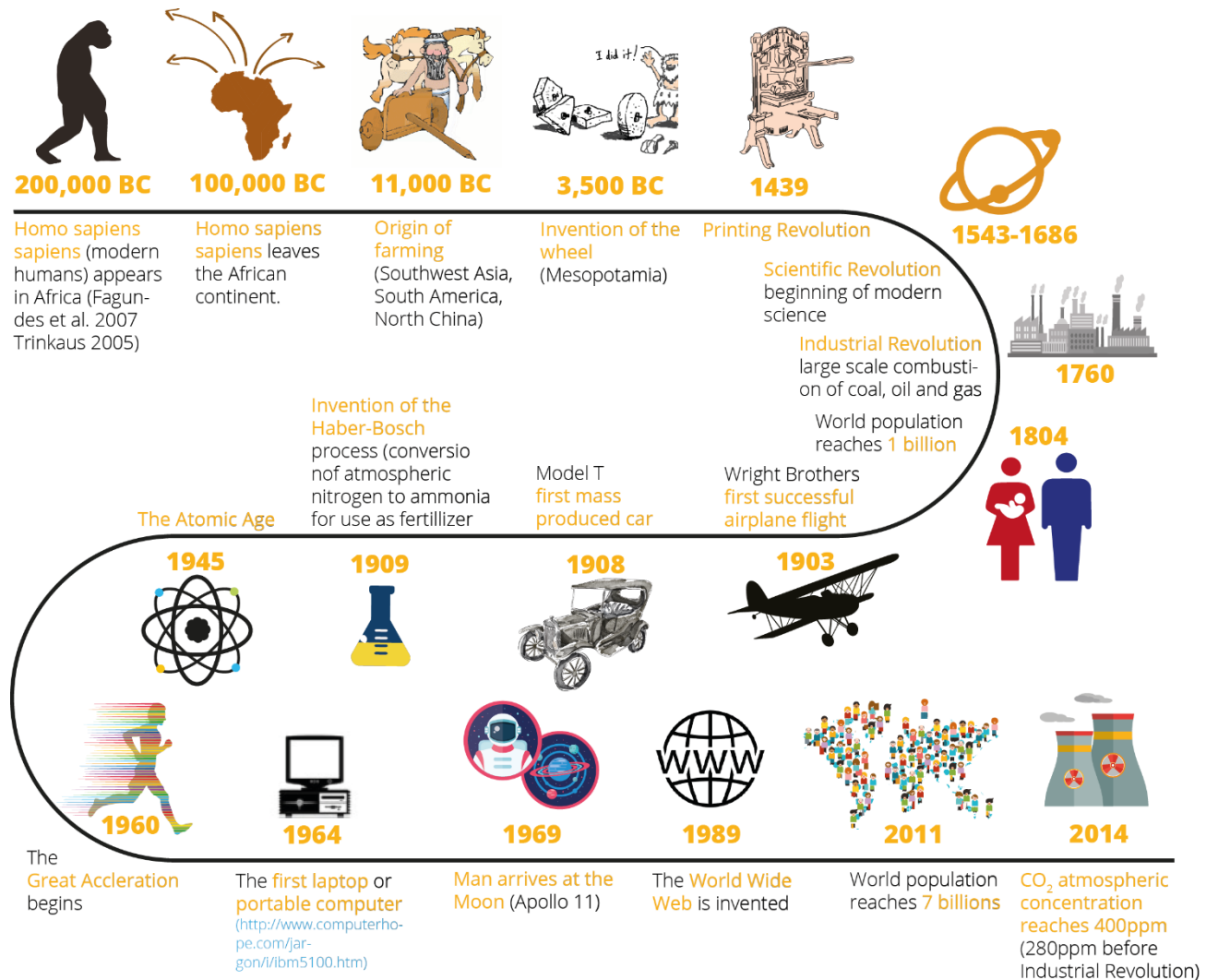


GLOBAL PRESSURES | ONE PLANET



HUMAN DEVELOPMENT

GLOBAL PRESSURES | HUMAN DEVELOPMENT



HUMAN POPULATION

GLOBAL PRESSURES | HUMAN POPULATION

TO THINK ABOUT....

Population (Billion)	Year	Years to increase 1 billion
1	1804	200,000*
2	1927	123
3	1960	33
4	1974	14
5	1987	13
6	1999	12
7	2011	12

- 1.6 to 6 billion
- Double (1950 – 1987)
- 2050: 9.7 billion
- 2100: 11.2 billion

Table 4: Population growth: years to increase population by 1 billion (adapted)(U.S. Census 2016)

** Based on estimations of the appearance of Homo sapiens sapiens. Human lineage is much older.*

Human population as been increasing immensely!

- How will be life in a world with 10,000 million population?
- What are the implications for the natural systems?
- What are the social, cultural, economic and environmental challenges?
- How to deal with scarcity?
- (...)
- **But in any case.....**

MORE DEMAND...

- Food, energy, goods & services, minerals, etc..

...MORE WASTE

- Pollution of air, water and soil.

MORE PEOPLE = MORE PRESSURE ON NATURAL RESOURCES

But all humans have the same fundamental rights to aspire to a better quality of life

- Economic well being, comfort, health care, education;
- Access to technology, infrastructures;
- Fair and safe work conditions;
- Live in a clean environment;
- Safe drinking water, air, nutritious food;

SUSTAINABLE AND FAIR | NEW SYSTEMS AND MODELS

URBANIZATION

GLOBAL PRESSURES | URBANIZATION



Since 2007 there are more people living in urban than in rural areas

(UNFPA 2009) •

70% of Europe's population live in towns or cities (Brink et al. 2015).

GLOBAL PRESSURES | URBANIZATION

Rural population will decrease

Urban population continues to increase



MEGACITIES (> 10 million)

- 1990: **10** megacities,
- 2014: **28** megacities
- 2030: **41** megacities (estimate)

MODERN INTENSIVE FOOD PRODUCTION

The **Green Revolution** (1950's)

- new ways to produce food;
- intensive agriculture;
- new crops;
- new farming methods;
- **synthetic agrochemicals** (**fertilizers, pesticides** and **herbicides** extensively used in food production.

The use of fertilizers accounts for 50% of yield increase in crops



GLOBAL PRESSURES | MODERN INTENSIVE FOOD PRODUCTION



GLOBAL PRESSURES | MODERN INTENSIVE FOOD PRODUCTION



GLOBAL PRESSURES | MODERN INTENSIVE FOOD PRODUCTION



BIODIVERSITY LOSS

GLOBAL PRESSURES | BIODIVERSITY LOSS

Habitat change, loss, and degradation affects 86% of all threatened birds and mammals assessed and 88% of the threatened amphibians (Secretariat of the Convention on Biological Diversity 2006).

Climate Change.

Modifications in surface temperature, ocean temperature, rainfall distribution or weather patterns, affect ecosystems, habitats and species distribution, threatening the survival of species that can't adapt or migrate fast enough.

Overexploitation of natural resources: overhunting, overfishing and over-harvesting. Many populations cannot regenerate at the present rate of extraction causing population decline, extinction, dangerous negative impacts on food-webs, food security and ecosystems services.



Invasive alien species impacts negatively on ecosystems and the survival of native species.

Pollution. Human action causes all kind of air, water and soil pollution and interference with nutrient cycles and natural processes. Persistent organic pollutants, pharmaceuticals, acid deposition, heavy metals, herbicides, pesticides or plastic are just a few examples of pollutant substances that contribute to biodiversity loss.

GLOBAL PRESSURES | BIODIVERSITY LOSS

6th mass extinction in Earth's 4.5 billion years history?

The average rate of **vertebrate species loss** over the last century is up to **1,000 times** higher than the background rate (Ceballos et al. 2015).

Biodiversity loss is one of the main environmental problems

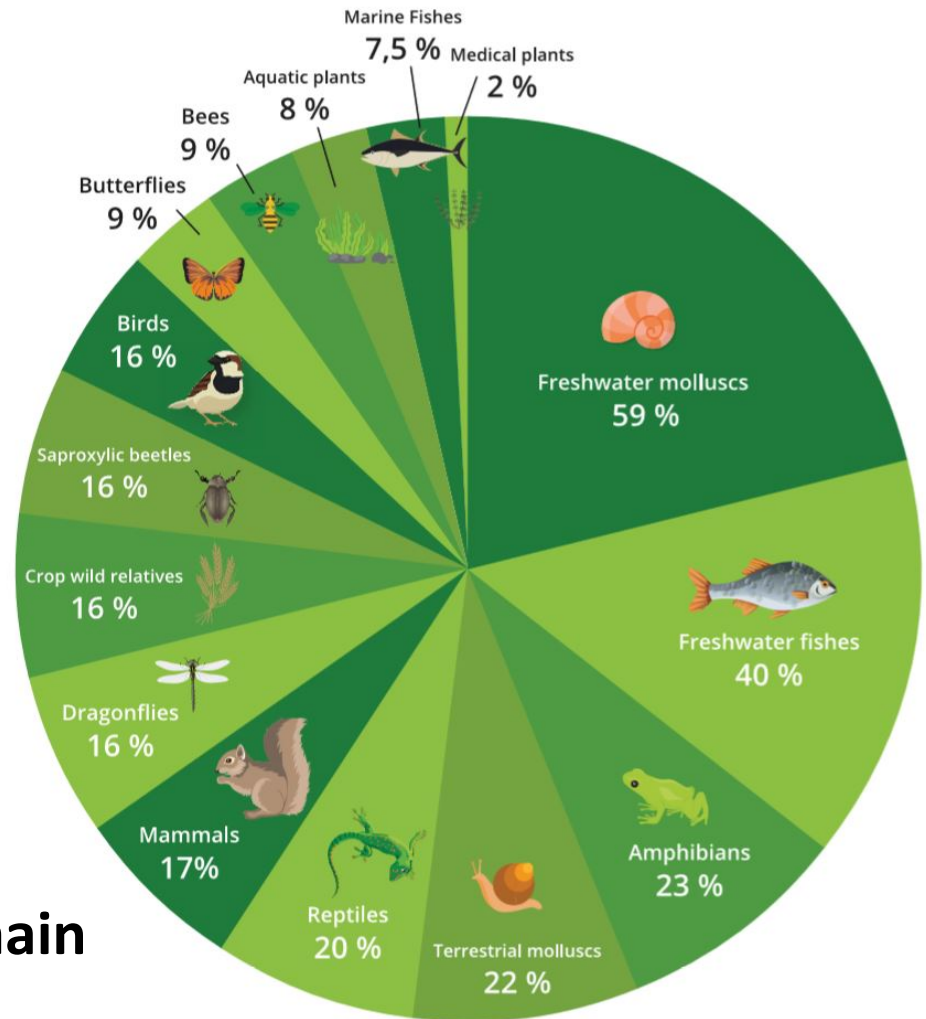


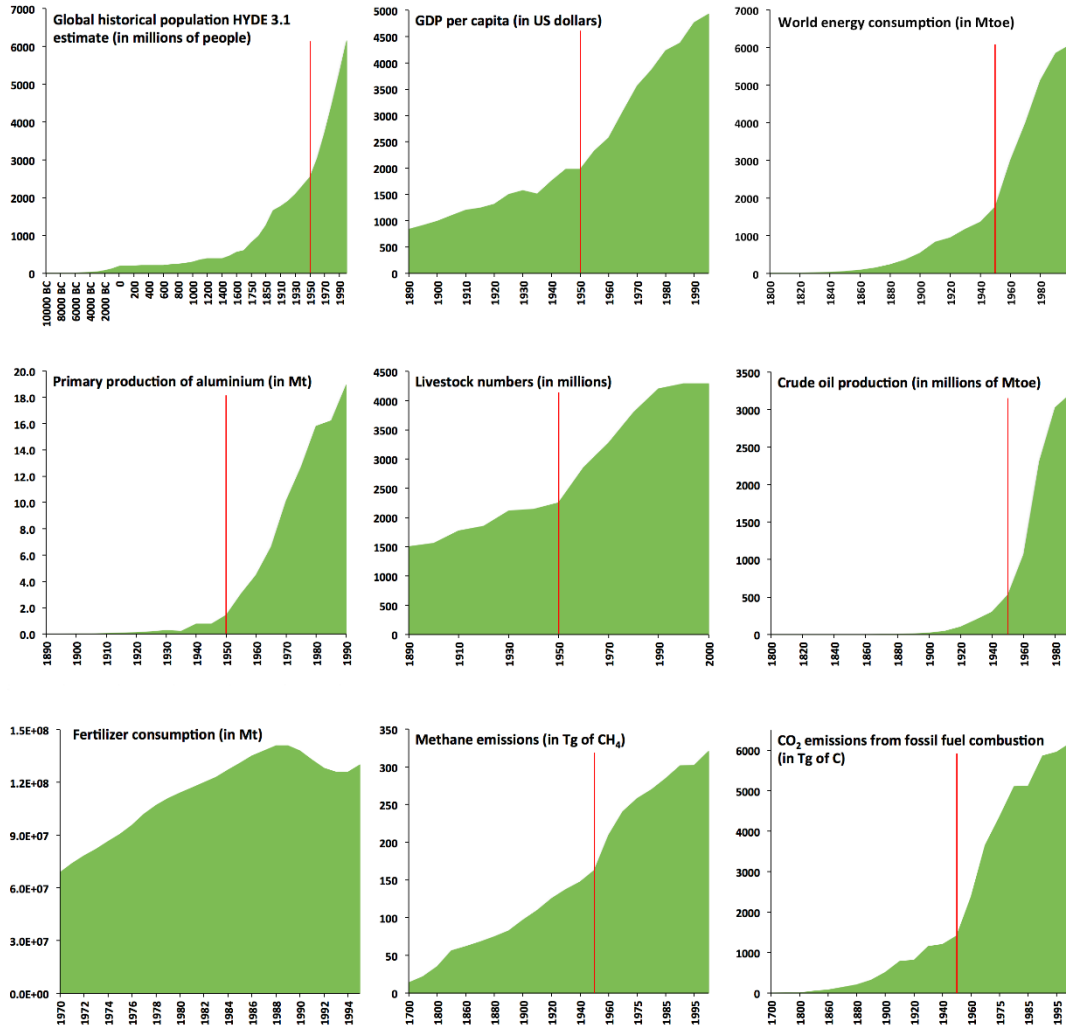
Figure 2: Overview of European species threatened (IUCN 2011)

THE GREAT ACCELERATION

GLOBAL PRESSURES | THE GREAT ACCELERATION

Since 1750, both Earth systems and socio-economic indicators have increased to unprecedented levels in human history.

The Great Acceleration



Graphs generated using data compiled by the History Database of the Global Environment (HYDE, Netherlands Environmental Assessment Agency, <http://themasites.pbl.nl/tridion/en/themasites/hyde/index.html>) from references cited there.

GLOBAL PRESSURES | THE GREAT ACCELERATION

Socio-economic

- Water use
- Large dams
- Paper production
- International tourism
- Transportation
- Telecommunications

Earth system

- Ocean acidification
- Terrestrial biosphere degradation
- Tropical forest loss
- Surface temperature
- Marine fish capture




THE ANTHROPOCENE

GLOBAL PRESSURES | THE ANTHROPOCENE

“The human species has become such a global dominant driving force that is now capable of changing profoundly planet Earth’s natural geophysical and biological processes.”

GLOBAL PRESSURES | THE ANTHROPOCENE

Climate stability allowed the development of agriculture and unprecedented human development.

Eonothem / Eon	Erathem / Era	System / Period	Series / Epoch	Stage / Age	GSSP	numerical age (Ma)
		Quaternary	Holocene			present
			Pleistocene	Upper		0.0117
				Middle		0.126
				Calabrian		0.781
				Gelasian		1.80
						2.58

To cite: Cohen, K.M., Finney, S.C., Gibbard, P.L. & Fan, J.-X. (2013; updated) The ICS International Chronostratigraphic Chart. Episodes 36: 199-204.

URL: <http://www.stratigraphy.org/ICSchart/ChronostratChart2016-12.pdf>

GLOBAL PRESSURES | THE ANTHROPOCENE



QUICK SUMMARY

GLOBAL PRESSURES | SUMMARY

1. There is only **one planet**! And we must try harder to respect it!
2. **World population** is increasingly rapidly: all kinds of challenges in future!
3. Planet Earth is becoming **urbanized**.
4. Current **food production** systems have too much to environmental problems.
5. **Biodiversity loss** is happening. 6th mass extinction? Biodiversity is vital to human wellbeing.
6. The **Great Acceleration** is unprecedented and demonstrates the full extent of human activity.
7. The **Anthropocene**: humans have become a dominant driving force capable of influencing the Earth's biogeochemical processes.

There are NO EASY SOLUTIONS!

RAISE AWARENESS!

INDIVIDUAL ACTION!

LOCAL RESPONSES !

COMMUNITY ACTION!

STAKEHOLDERS INVOLVEMENT!



Thank you

Time for a break!!