Exploitation or care – how we relate to the resources of our planet

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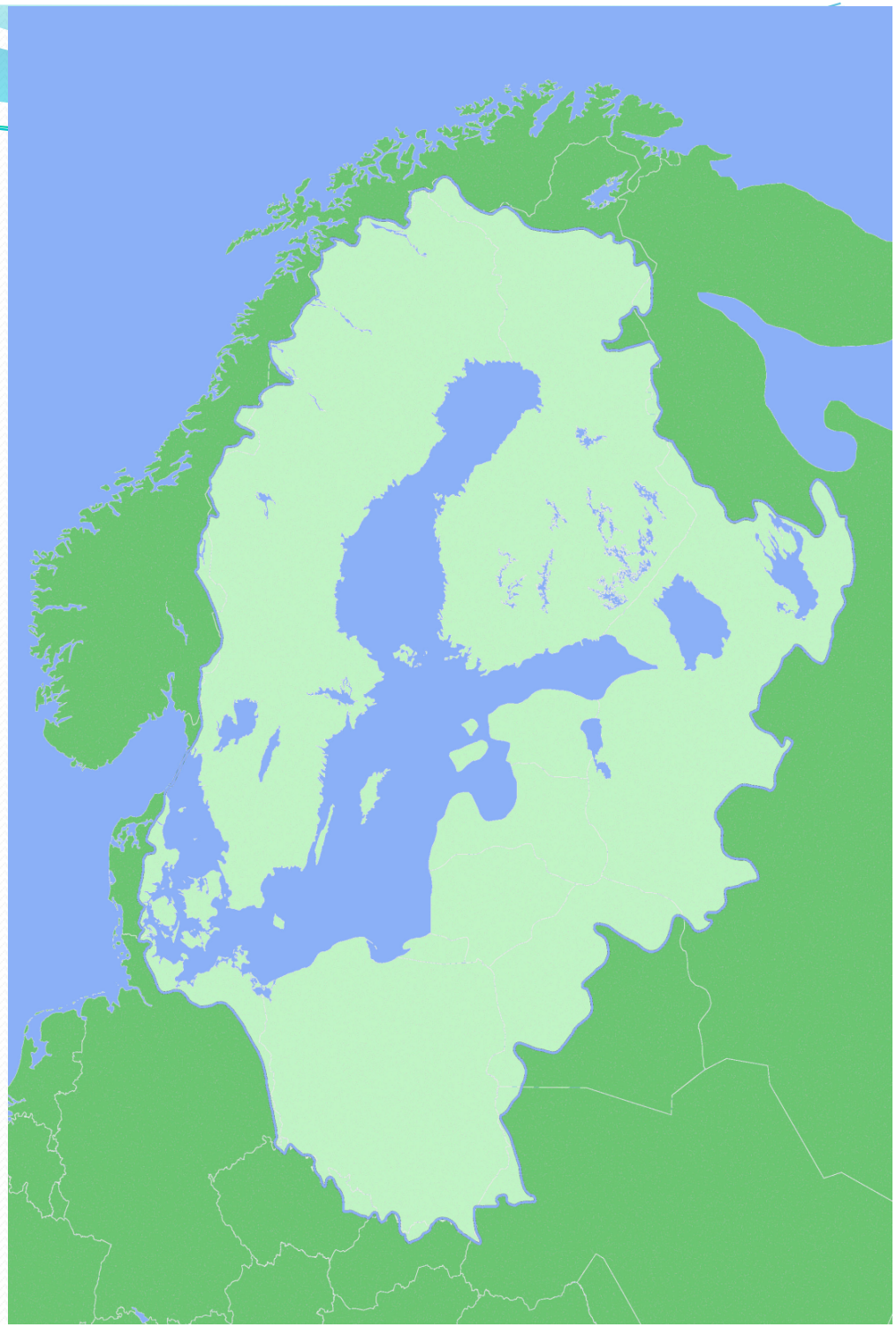
Climate Existence
Sigtunastiftelsen
1-3 November 2010



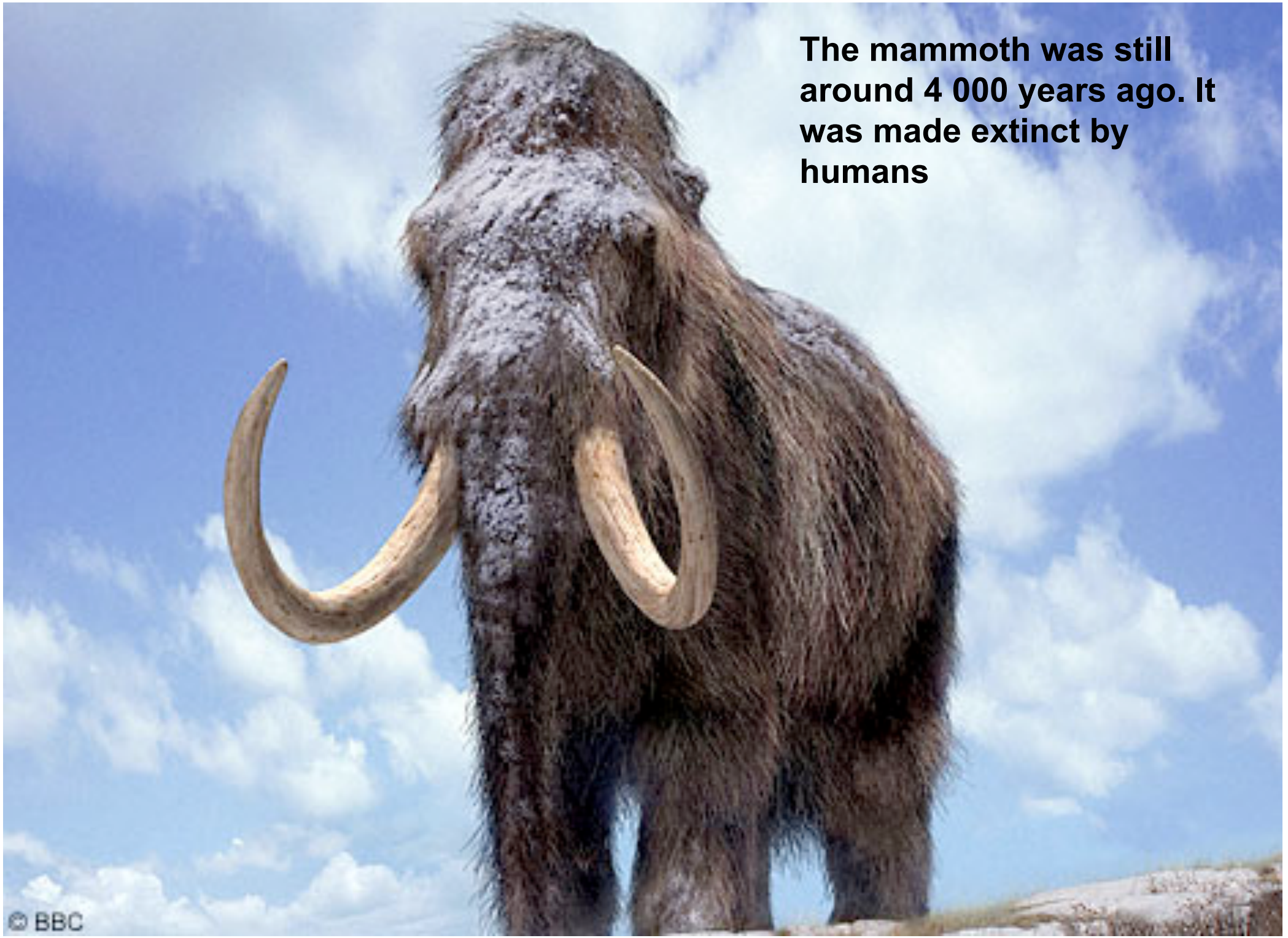

Three kinds of resources
(providing ecosystems services)
1. Animals– regeneration time years
2. Forests – regeneration time decades
3. Soil – regeneration time centuries

Exploitation or care?

- What does history tell us?
- Which are the reasons for exploitation?
- Good examples of wise management
- How do we turn the tide from exploitation to care

I. Animals and Biodiversity crisis

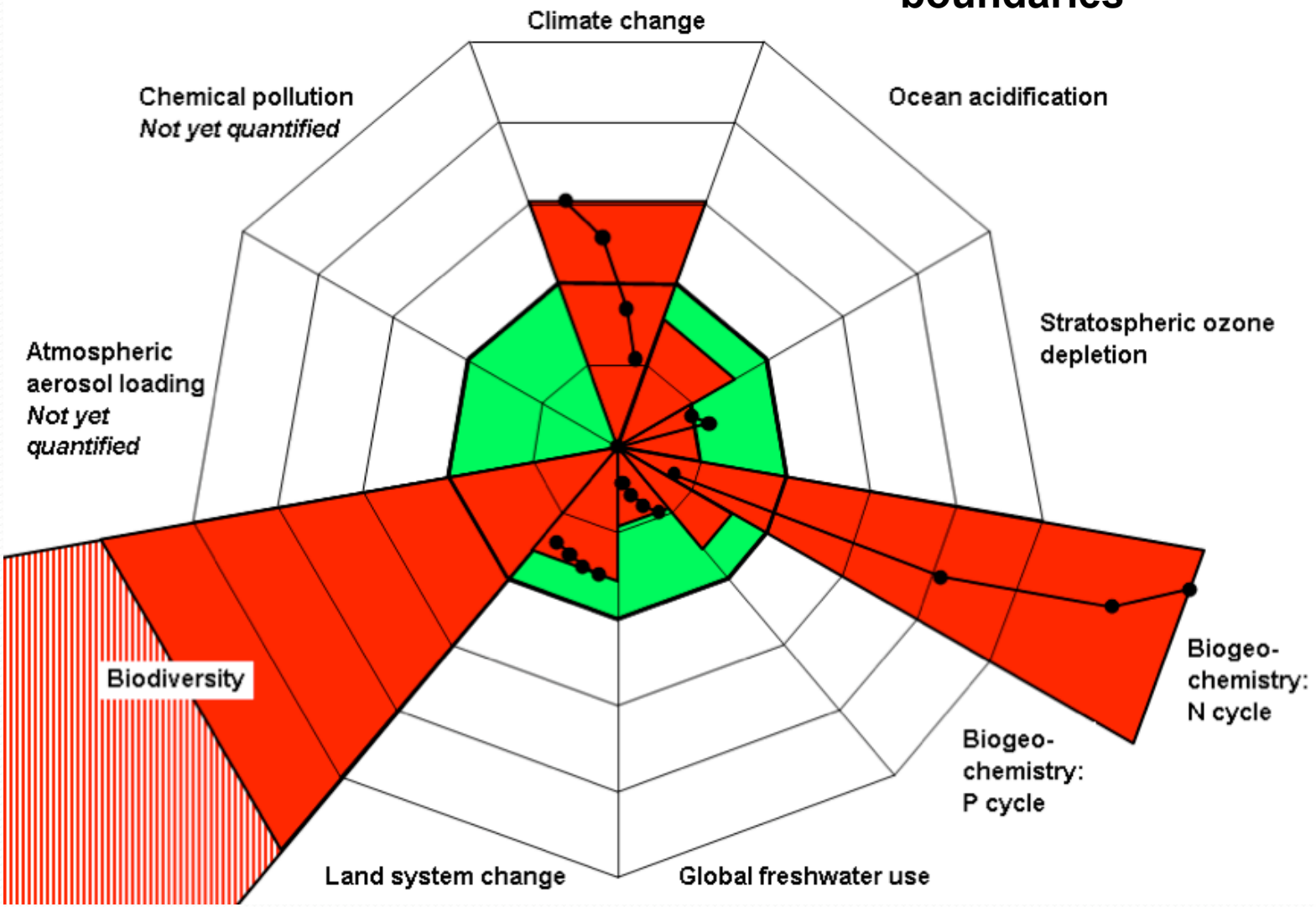
- The story of biodiversity decrease accelerates through millenia, centuries and years
- Extinction of the American megafauna; the European megafauna; May the African megafauna be saved?
- The story of fishing culminated in the 1990s with peak fish and the extinction of the Newfoundland cod population.


The mammoth was still around 4 000 years ago. It was made extinct by humans
© BBC


The European Bison was almost extinct in the 1920s.
It was saved by humans.
Here bisons in the Byelavesha Forest in Belarus

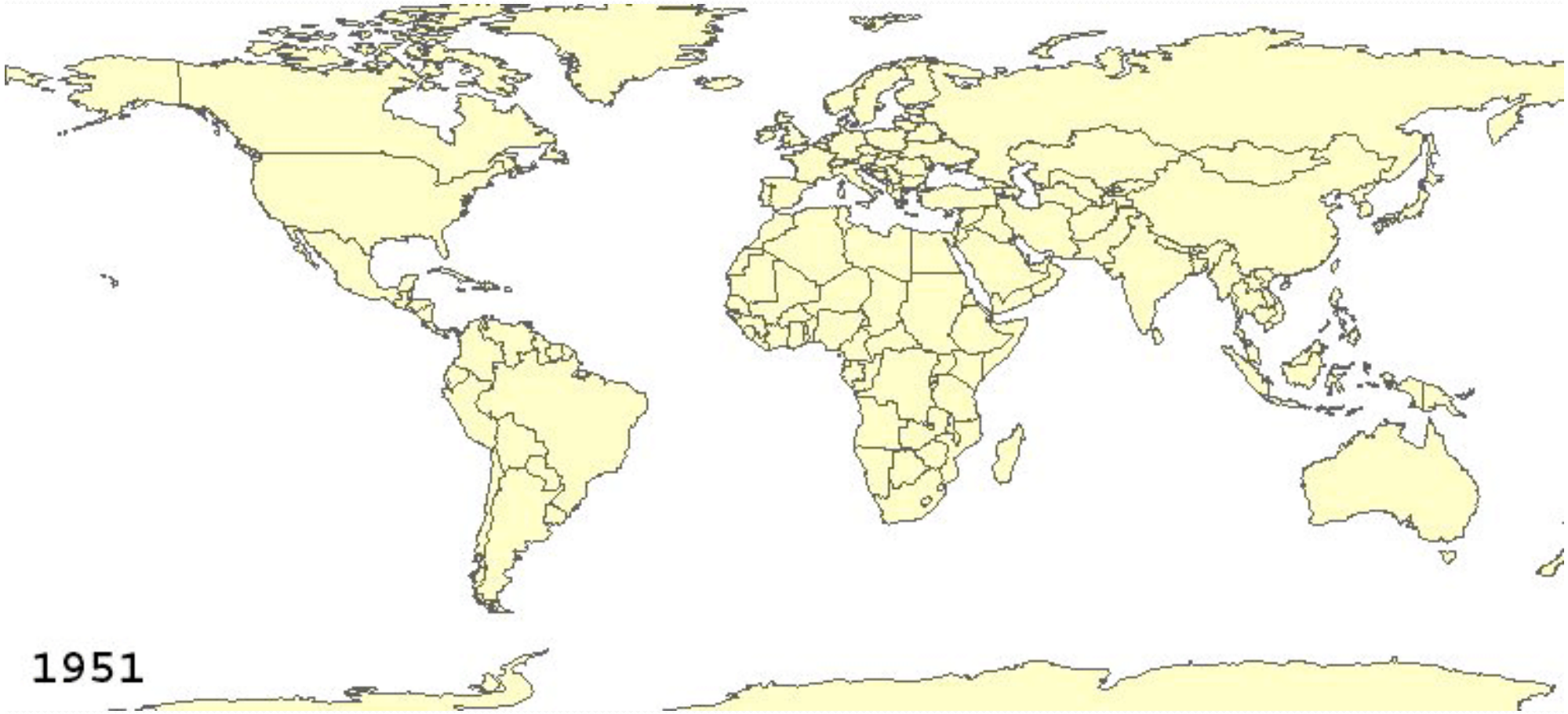
Planetary boundaries

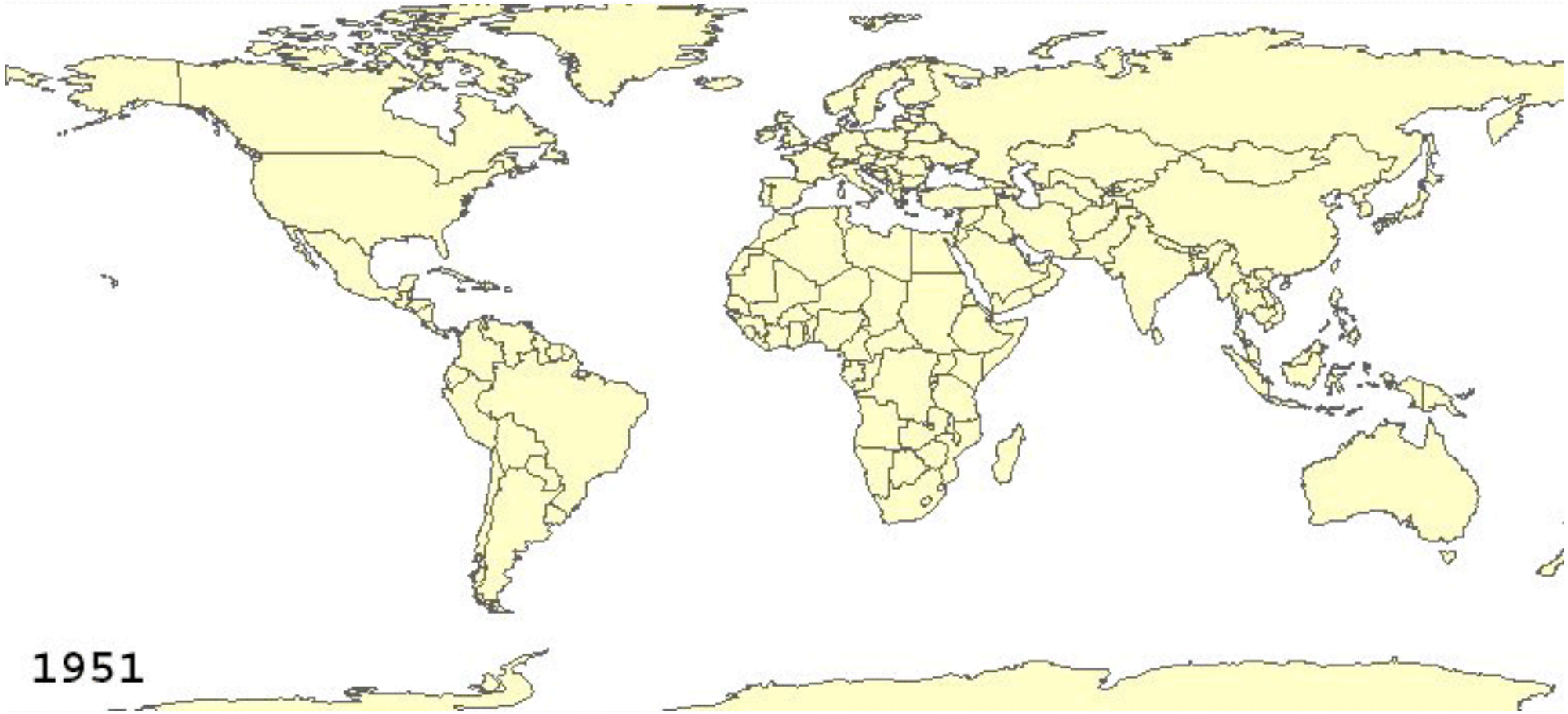
Biodiversity loss is the worst case of breaking planetary boundaries



Rockström, J. et al., 2009. Nature, September 24, 2009.

Fisheries

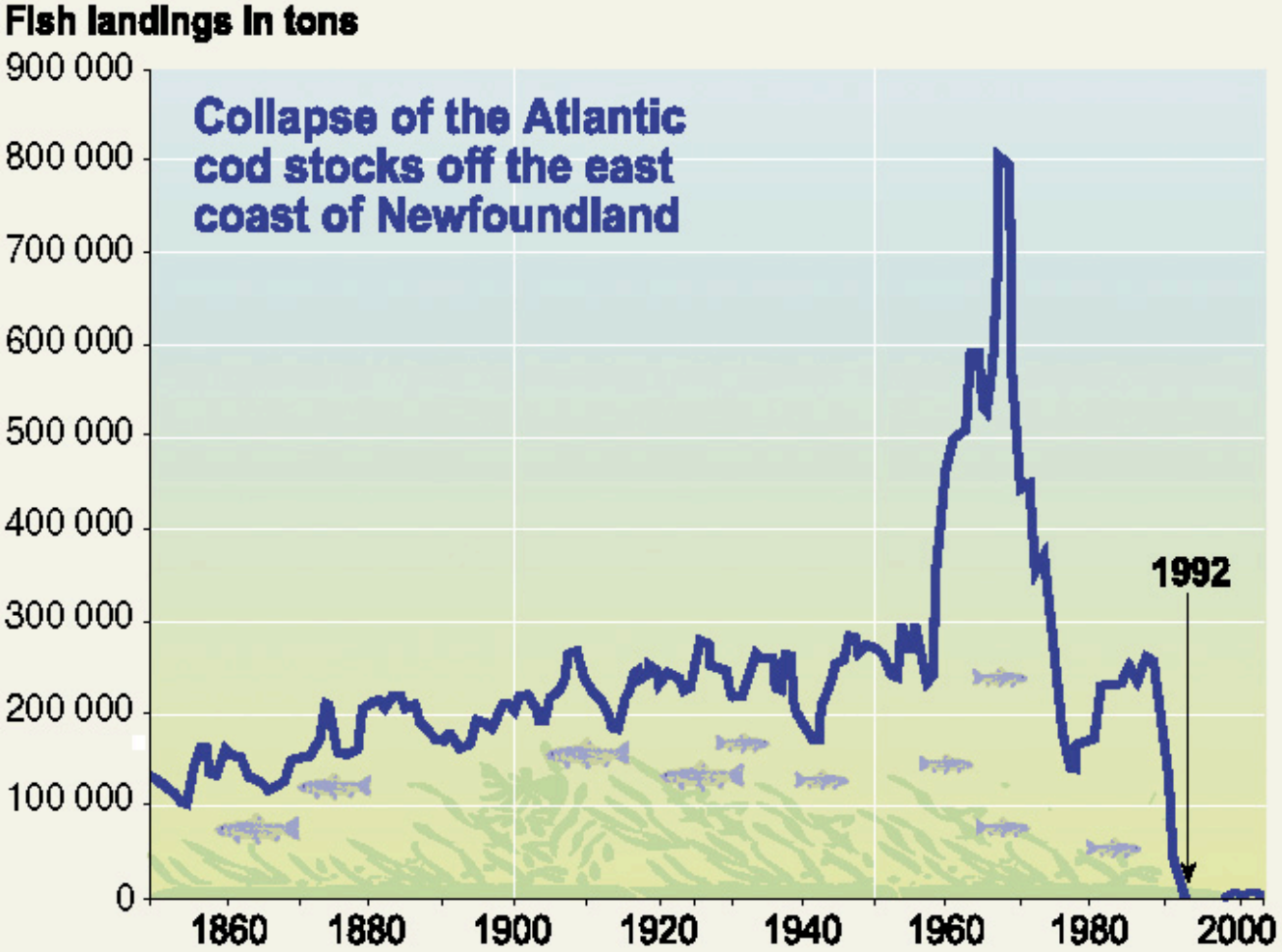



1951

Global Footprint Network

Marine Fisheries

The dramatic collapse of cod stocks off Newfoundland illustrates how quickly the services of an ecosystem can disappear when its resources are overexploited.



Source: Millennium Ecosystem Assessment

Why did things go wrong?

1. Technical development
2. Economic pressure
3. Denial mechanisms
4. Tragedy of the common
5. Value questions

II. The forests

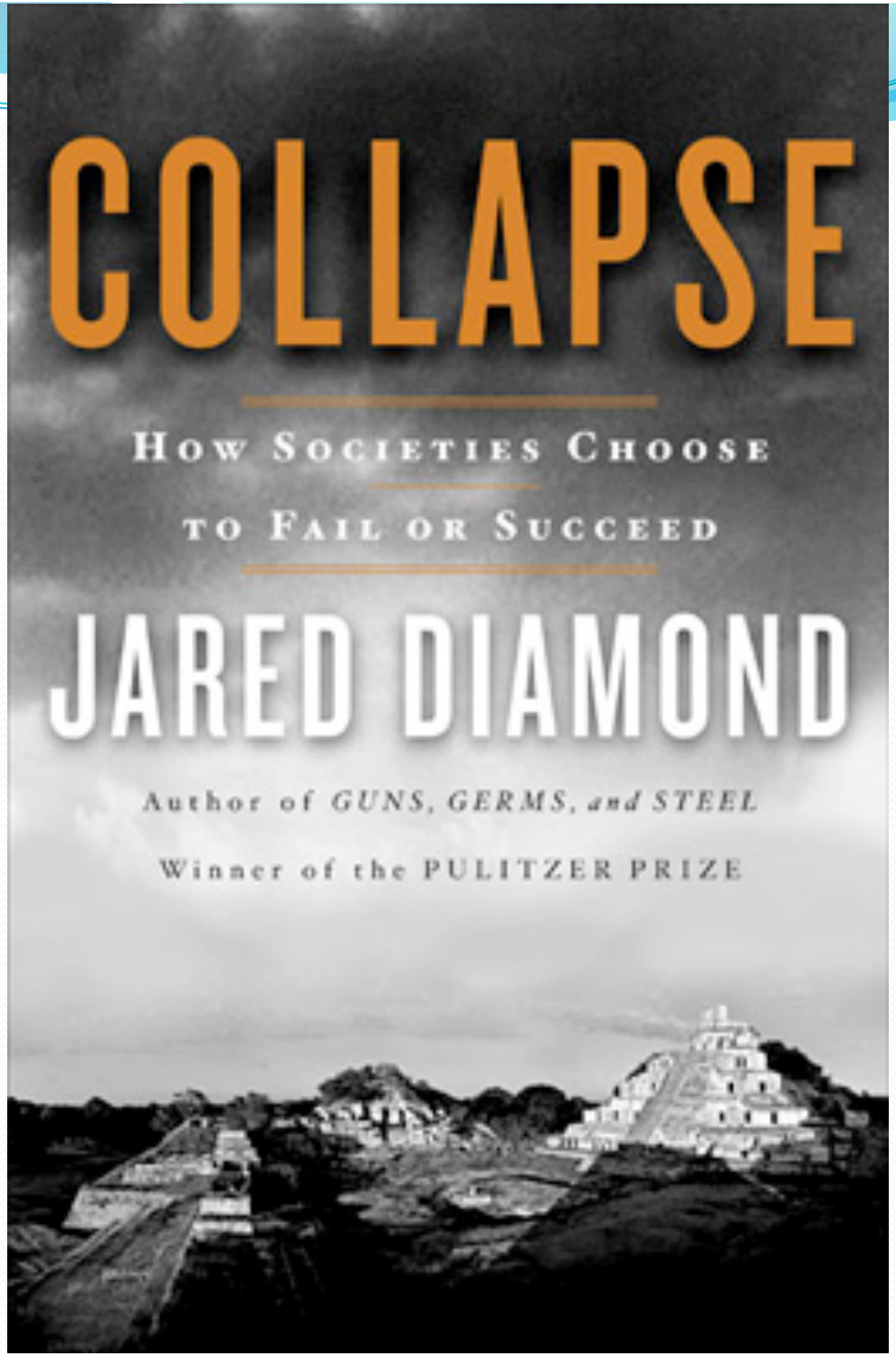
Half of the original forests of our planet is gone, and the land used for other purposes. Half of the rest is foreseen to be cut down during the 21st century.

The forest crisis in Europe 1700s

In the kingdom of Saxony August the Strong, known for his taste for women and of course his strength, had the richest silver mine in Europe; And wanted more silver.

The silver was mined using timber - for building shafts, and smelting and refining the ore. But timber was overused and getting rare. The forests were becoming clear-cut due to the large consumption of wood.

Societies collapse because they did not preserve and manage properly their ecosystems.
Forests were cut down and land animals and fisheries overused.



Why did people make disastrous decisions?

1. **The problem was not understood, anticipated, recognized**
2. **"Creeping normality" and denial**
3. **Conflict of (economic) interest, especially between those far away and those close to the site.**
4. **Survival from day to day**
5. **Tragedy of the commons or selfishness or lack of society control**
5. **Value questions, especially religious values**

Based on Jared Diamond, Collapse, 2005

An example of good forest managment and development

Paolo Lugari: Founder of Las Gaviotas

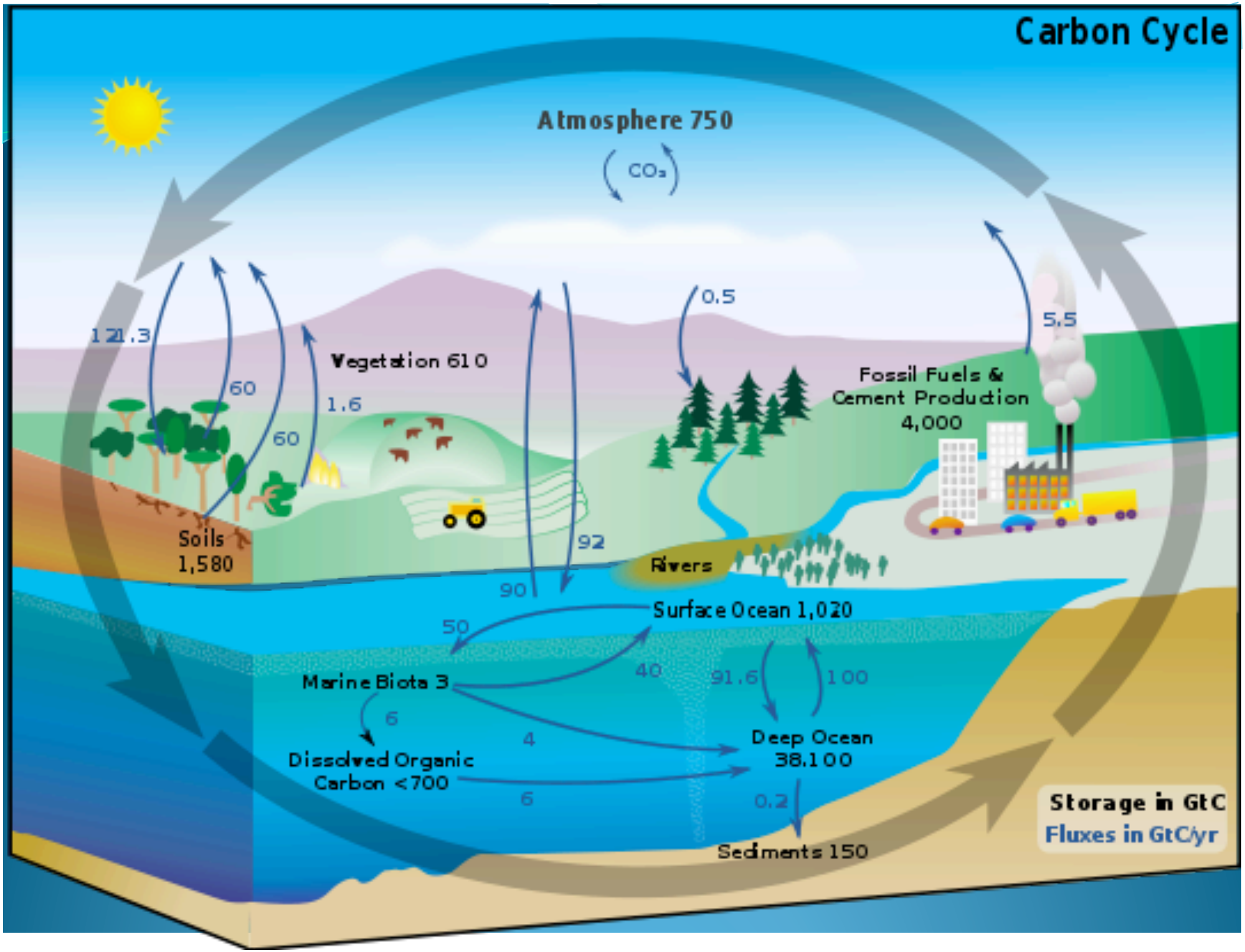
http://web.me.com/giocondaperezsnyder/Site/Paolo_Lugari.html
from 6.45

III. The soil

Ancient civilizations indirecty mined soil to fuel the growth as agricultural practice accelarated soil erosion well beyond the rate of soil production. ...

Soil abuse remains a threat to modern society: we see environmental refugees, the dust bowl in the 1930s US, the African Sahel in the 1970s and the Amazone basin today. The worlds population increases while the amount of productive farmland began declining in the 1970s..

David Montgomery. The erosion of civilisations, 2007


Carbon Cycle
Atmosphere 750
CO_2
121.3
60
60
1.6
Vegetation 610
0.5
5.5
Fossil Fuels &
Cement Production
4,000
Soils
1,580
92
Rivers
90
Surface Ocean 1,020
50
40
91.6
100
Marine Biota 3
6
4
Dissolved Organic
Carbon <700
6
Deep Ocean
38,100
0.2
Sediments 150
Storage in GtC
Fluxes in GtC/yr

The technical potential of C sequestration in soils of terrestrial ecosystems and restoration of peat soils is ~3 Petagram (Pg) C/yr (i.e. 3×1015 g=3×109 tonnes C/yr) or 50 ppm draw down of atmospheric CO2 by the end of the 21st century by increasing the soil C pool at a rate of 1 Mg/ha/yr. Depending upon climate and other variables, this could increase cereal and food legume production in developing countries by 32 million Mg/yr and roots and tubers by 9 million Mg/yr.

Beyond Copenhagen: mitigating climate change and achieving food security through soil carbon sequestration

Rattan Lal Food Sec. (2010) 2:169–177
DOI 10.1007/s12571-010-0060-9

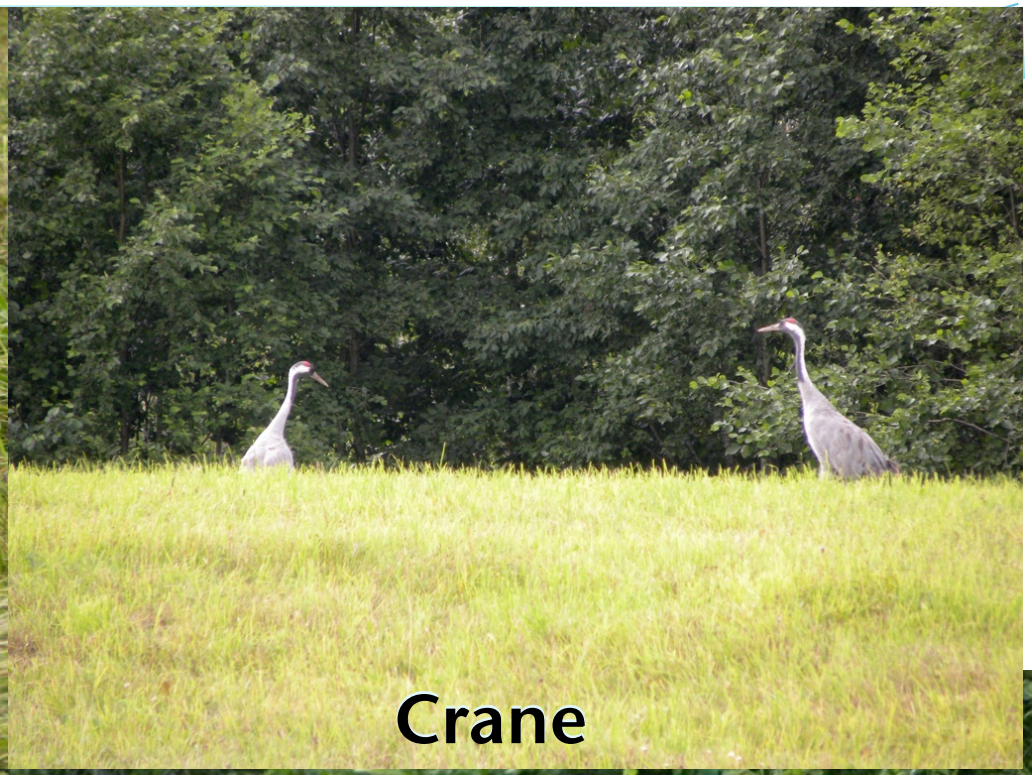
A letter to Swedish Ministry of Environment onthe Copenhagen COP15

In climate negotiations the focus has so far been dominated by emissions of greenhouse gases from combustion of fossil fuels. This focus leaves out the comparatively large flows of GHGs between atmosphere and forests and soil. In contrast to the fossils these flows also include sequestration (adsorption), and thereby preservation of forests and productive soils. These are important because:

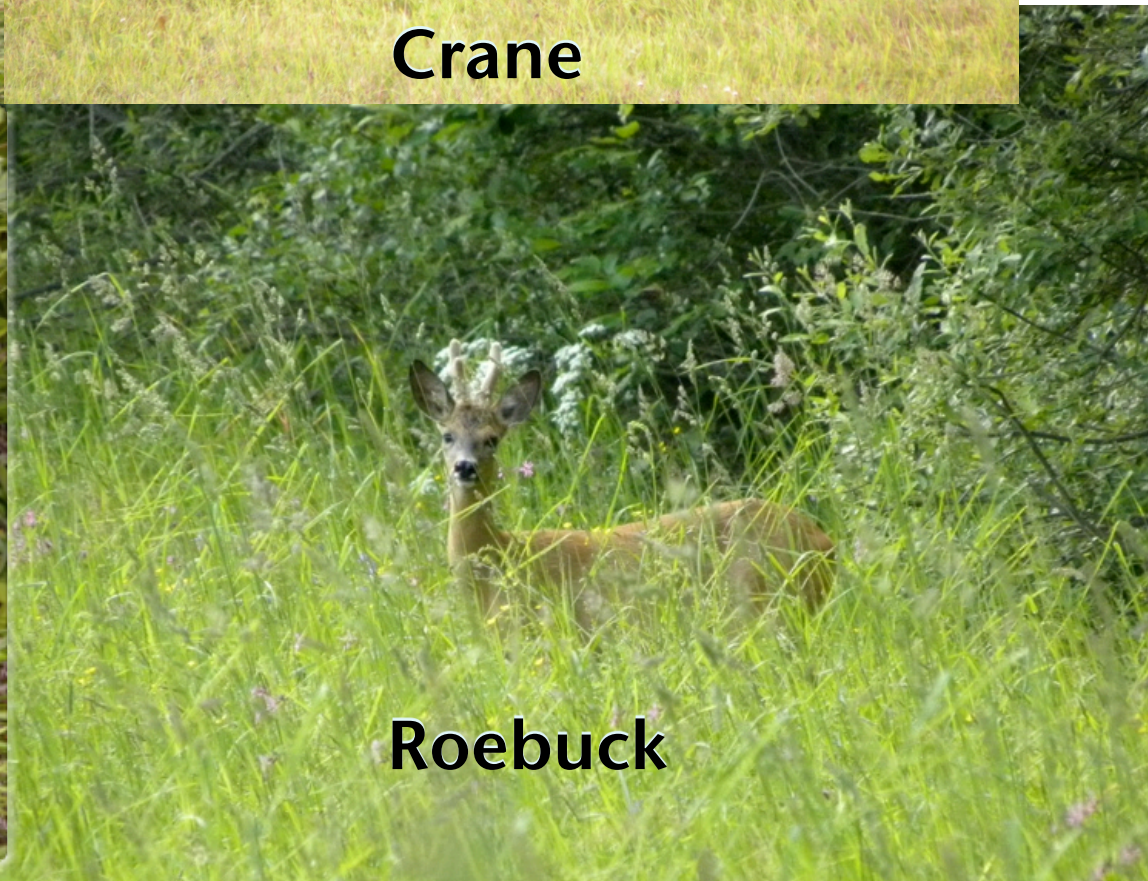
- Preservation and increase of forests is of paramount importance for biodiversity.
- Preservation and increase of organic content in soil is key importance for improvement of agriculture and since for economic development.
- Sequestration of carbon in forests and soil is in practice the only realistic means we have to reduce atmospheric CO_2 concentrations to a level, which appears to be necessary to avoid a galloping climate change according to recent research.
- It makes the contribution of non-industrial countries to climate negotiations important, since these countries forests and soil may be more important than industries.

All these possible outcomes of integrated management contribute to a sustainable development and strengthening of ecosystems services, especially those connected to forest production, agriculture, biodiversity and carbon sequestration.


Stork and snake


Crane


Hedgehog


Roebuck

What can we do to preserve and build soil?

Technically (some examples)

- Minimum tillage or no-tillage farming
- Agro-forestry
- Compost
- Biochar

Economically

- Include soil in carbon funding

Legally

- Protect soil

An example of good soil managment and development

The loess plateau project in China

http://hopeinachangingclimate.org/watch-the-film/index.html

Lessons from the Kenya Experience: Machakos District

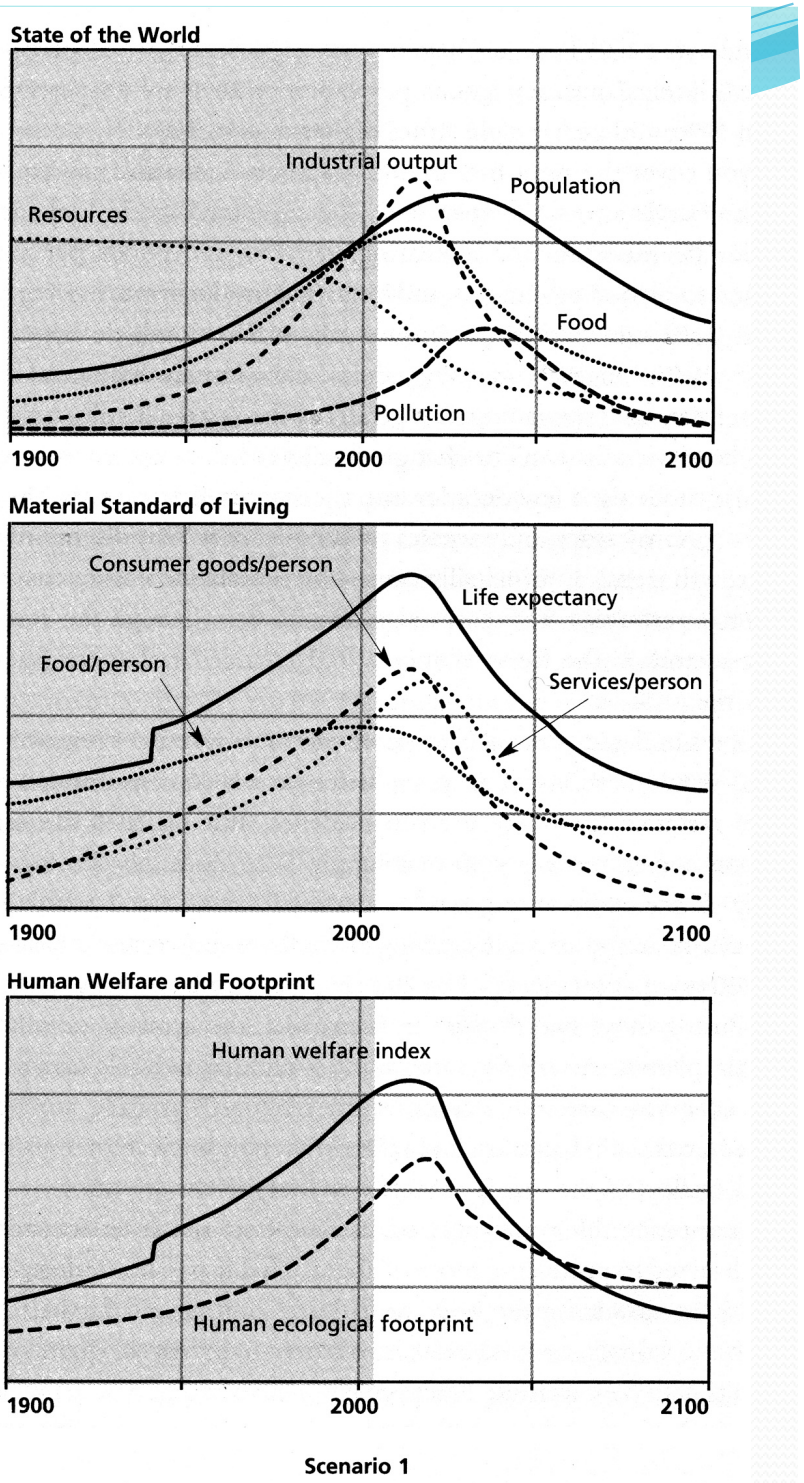
- Secure Land Tenure encourages long term investment in farms
- Access to markets generates commercial production
- Integrated crop and livestock production facilitates better nutrient management
- Achievements can only be sustained if population pressure can be controlled over time

Lessons from the Chinese Experience: Loess Plateau Region

- Focus on agricultural production as well as on ecosystem functions
- Integrate agricultural economy in overall economic development process
- Sustainability requires decreasing pressure on the land
- It takes a long time

Basic scenario in Limits to Growth 2003

World3



Global responsibility

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Four remaining large rivers in Sweden were protected from hydropower development in 1983.
Here a site at the preserved Vindelälven


In the 1970s the seals in the Baltic Sea were threatened by extinction – The cause turned out to be PCB. Today the seals are back in the Baltic Sea!

Thank you for your attention

www.balticuniv.uu.se