



Raphaël Stevens

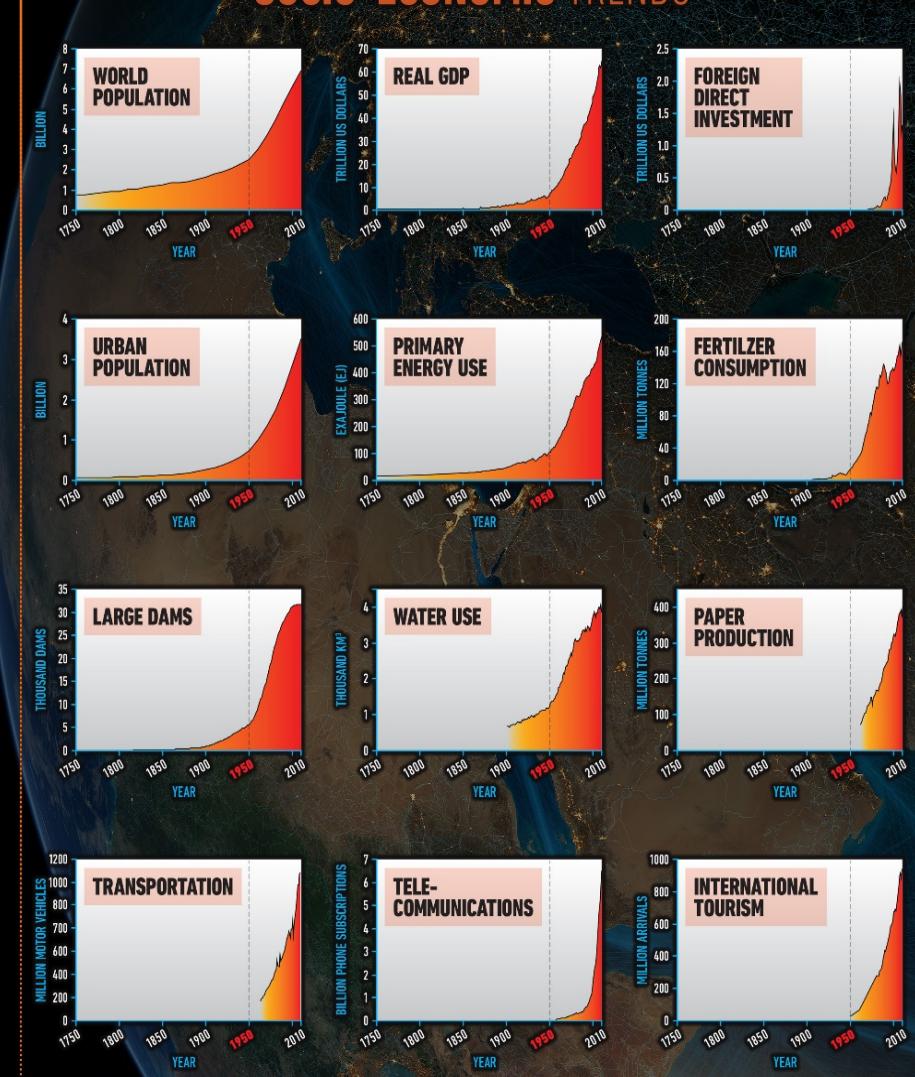
ERE - Eupen

22 -11 -2016

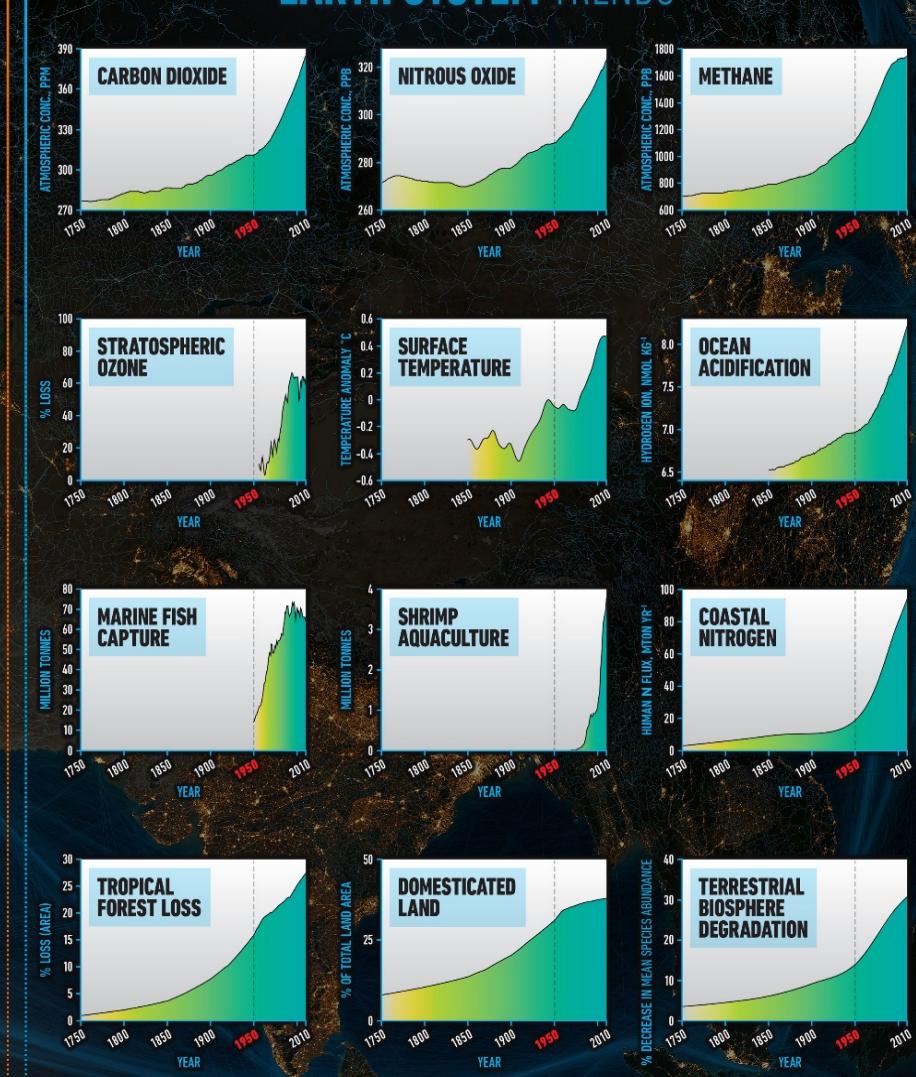
What a wicked problem!

THE GREAT ACCELERATION

SOCIO-ECONOMIC TRENDS



EARTH SYSTEM TRENDS

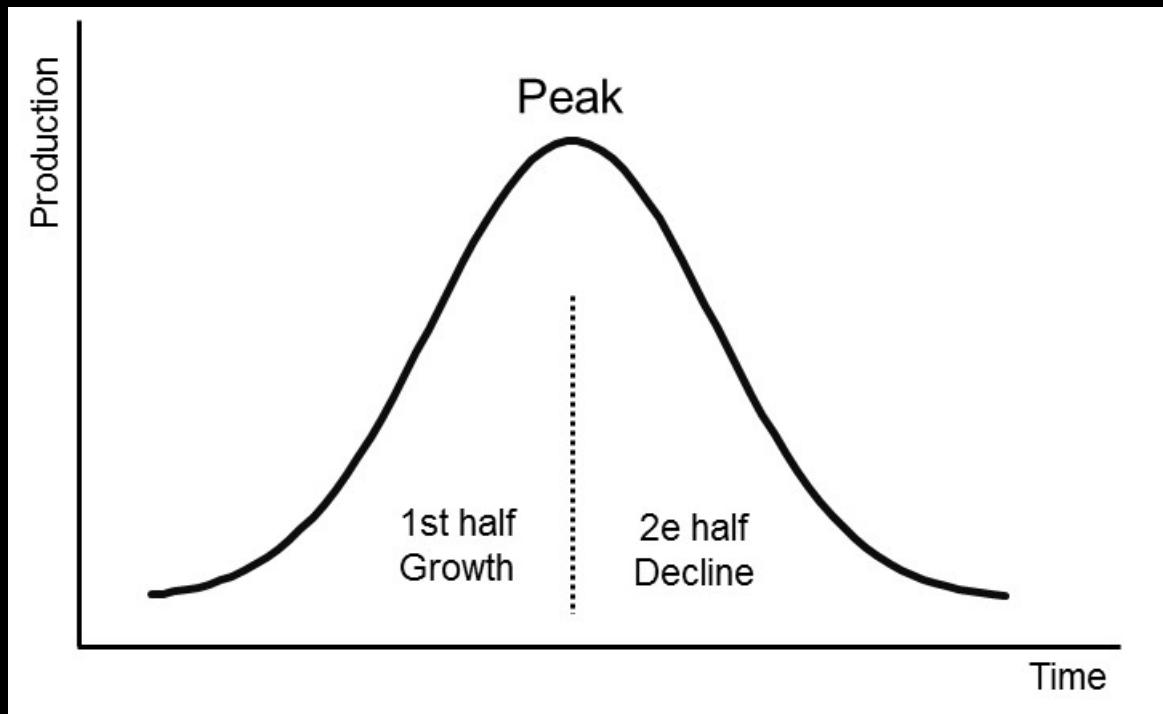


REFERENCE: Steffen, W., W. Broadgate, L. Deutsch, O. Gaffney and C. Ludwig, The Trajectory of the Anthropocene: the Great Acceleration, *The Anthropocene Review*, 16 January 2015.

MAP & DESIGN: Félix Pharand-Deschenes / Globalia

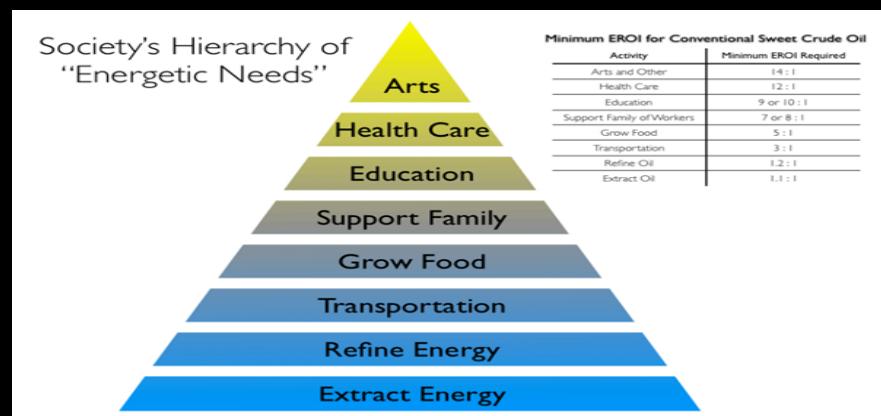
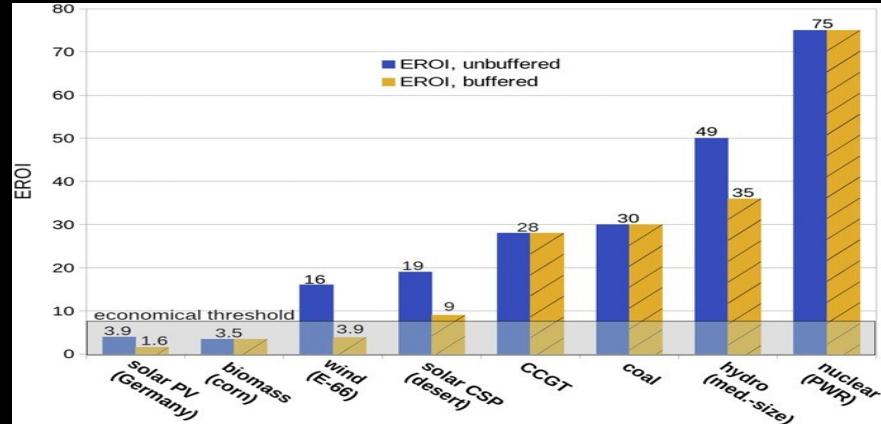
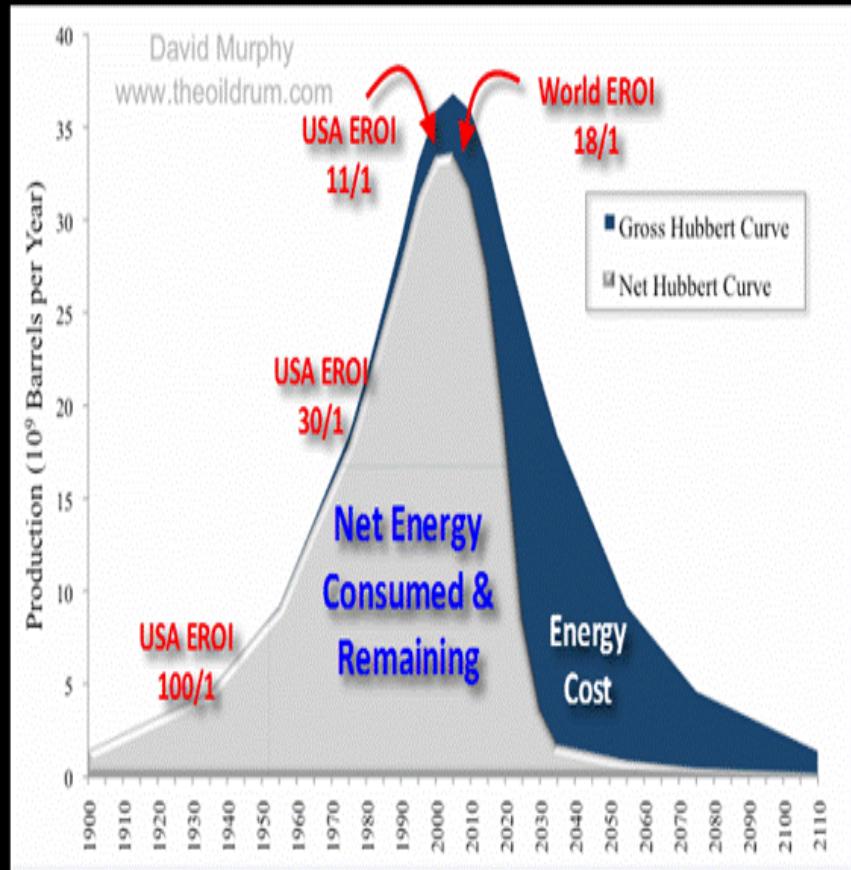
Limits (cannot be crossed over)

Fossil energy, deep aquifers, sand, metals, minerals, etc...
Towards “peak everything”



Energy Return on Energy Invested Net Energy

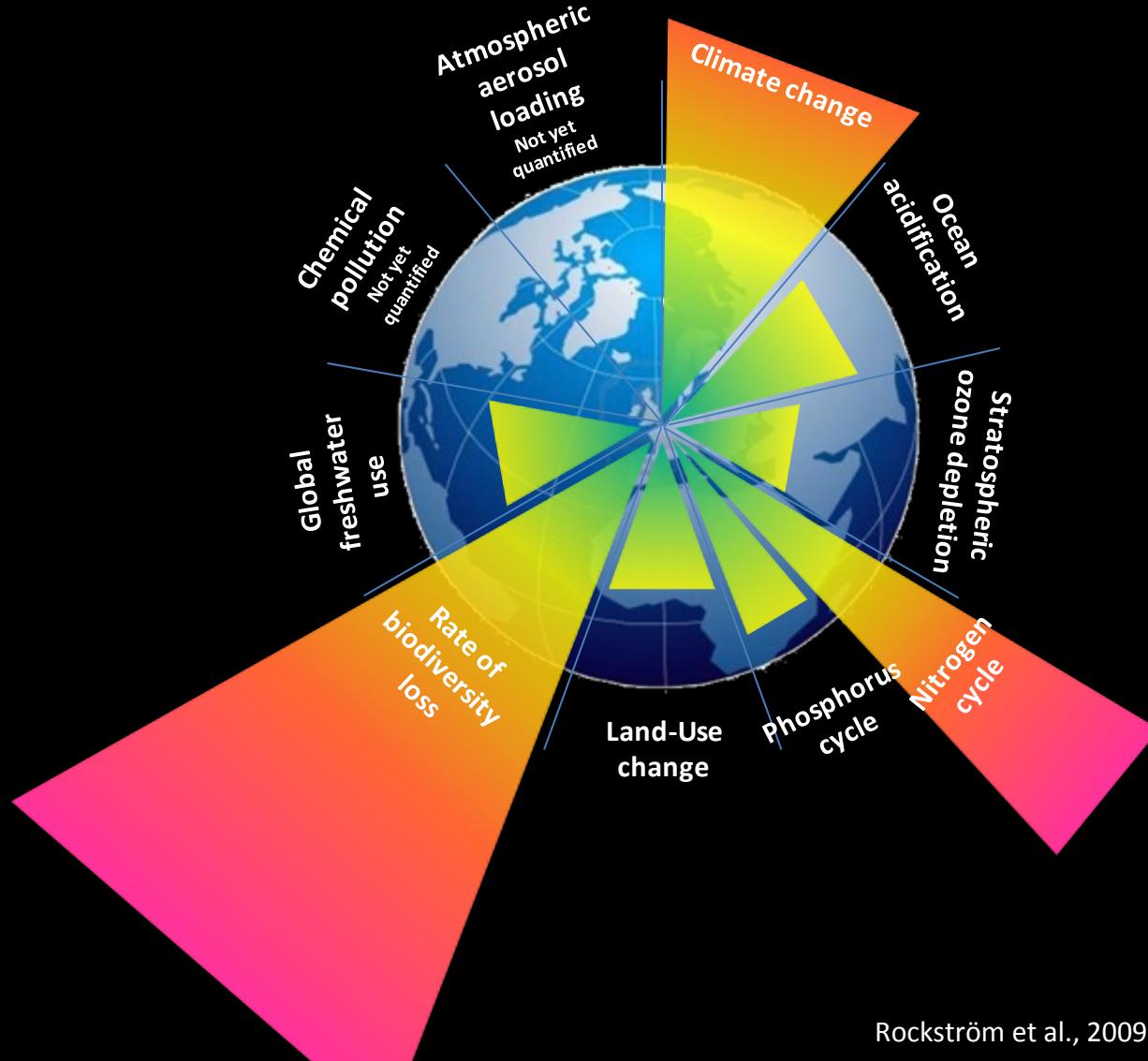
Weissbach *et al.* 2013



Lambert, J. *et al.*, 2014.
"Energy, EROI and Quality of Life", *Energy Policy*, 64, pp. 153–167.

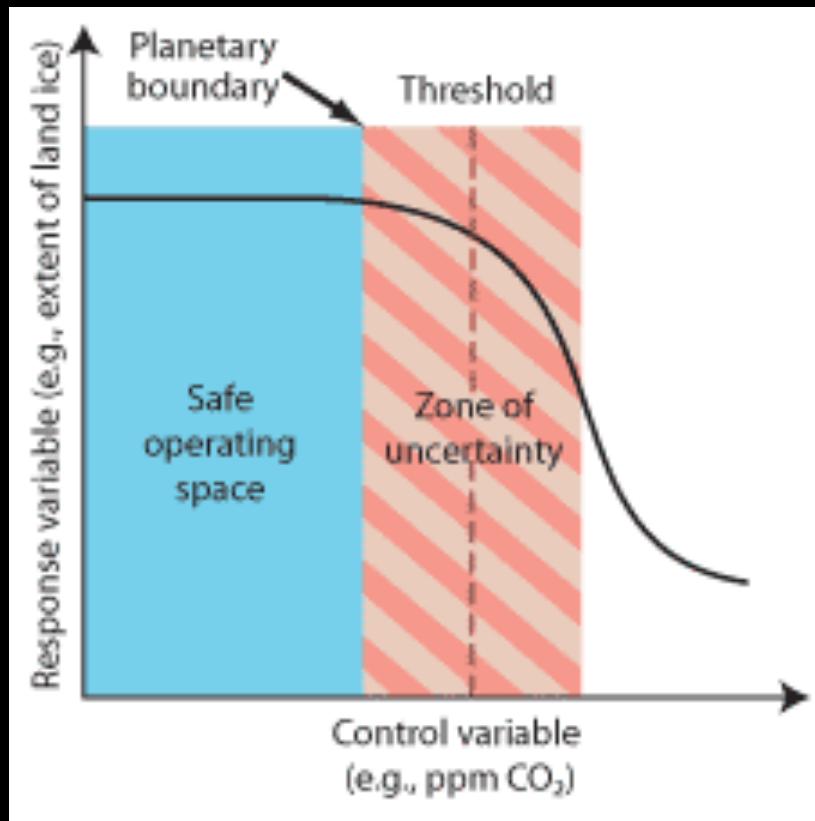
Boundaries (can be crossed over)

at our own
peril....

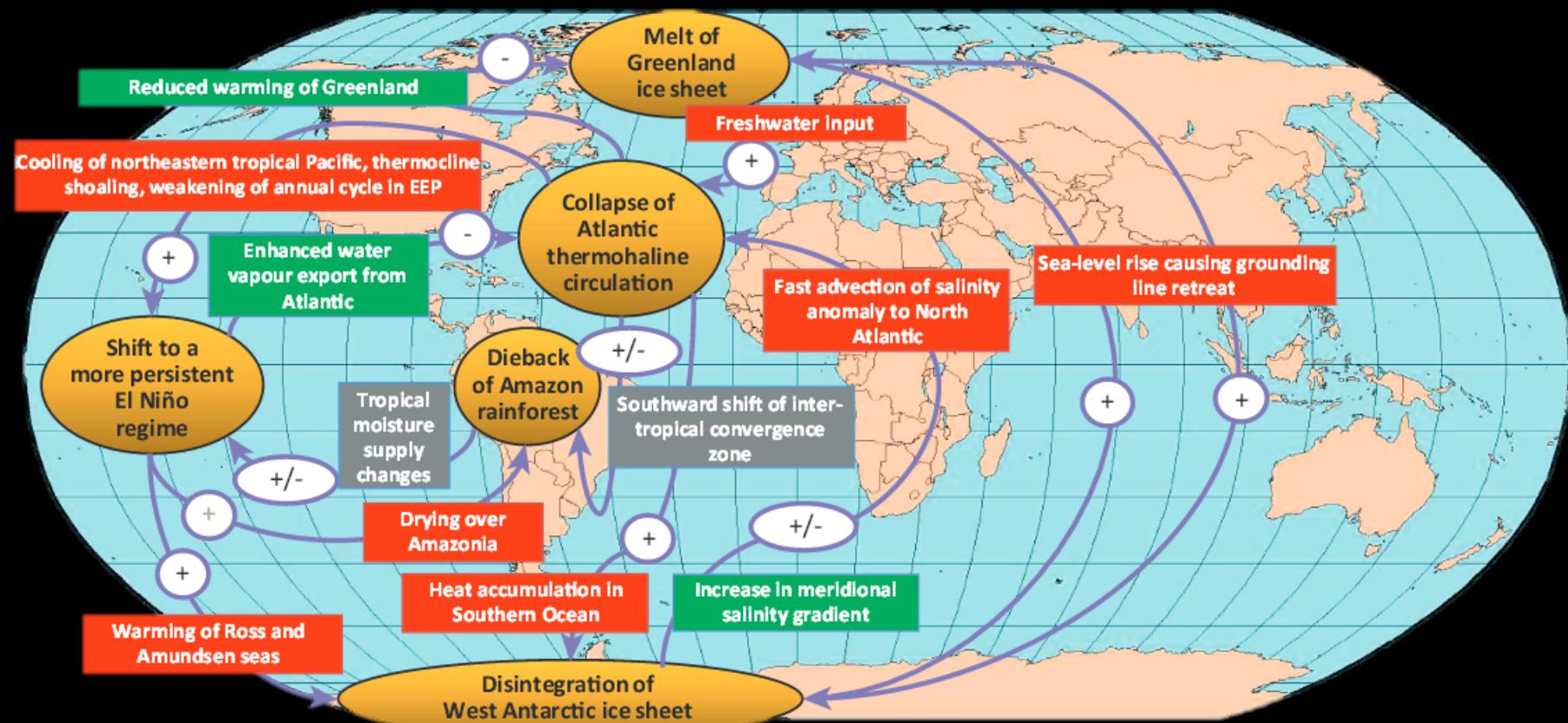


Rockström et al., 2009. *Nature*, 461(7263), pp.472–475.

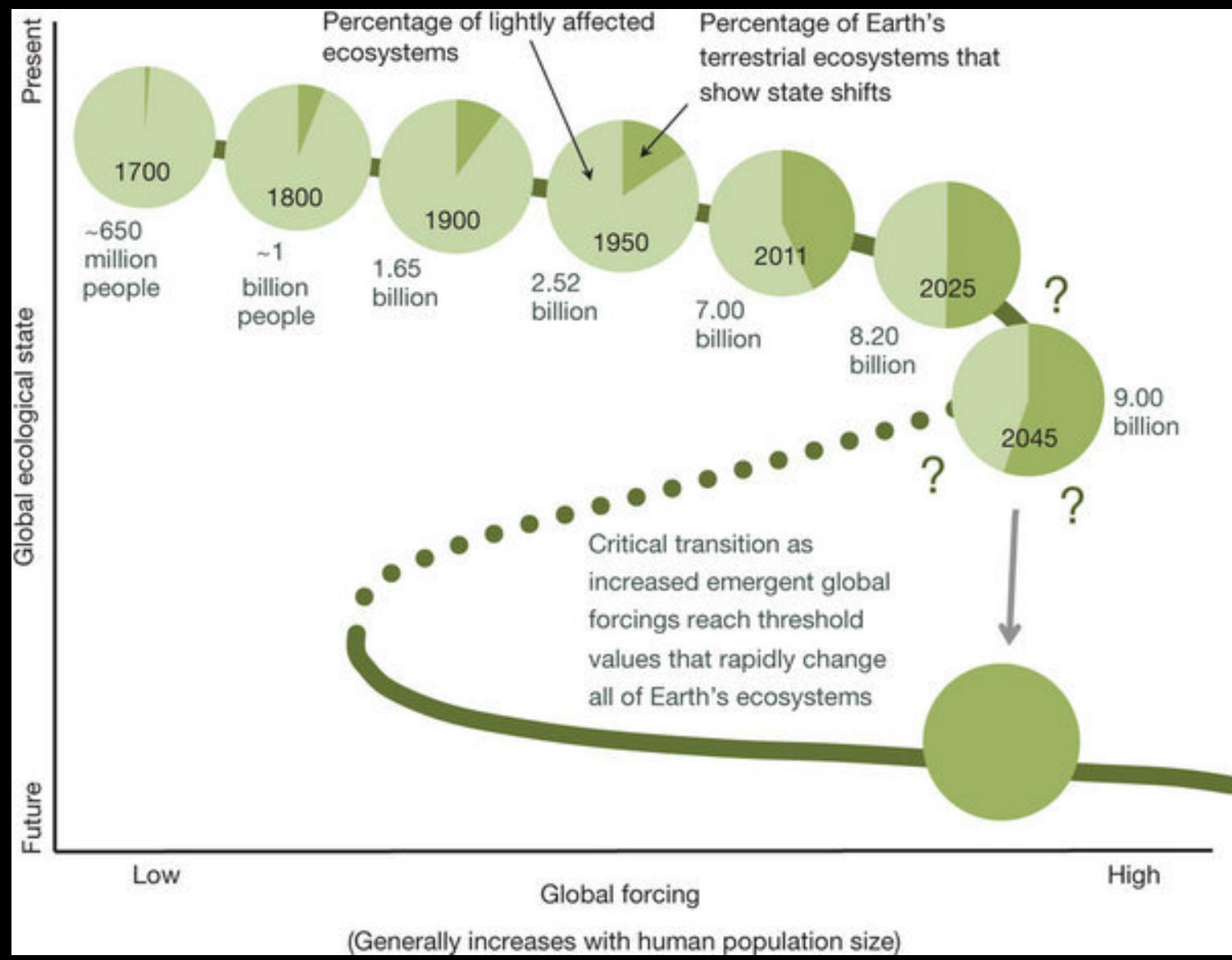
Tipping points & uncertainty



Climate complexity



LENTON T. M. et WILLIAMS H. (2013) *Trends in Ecology & Evolution*, vol. 28, n° 7.



Systemic risks

- Tipping points
- Cascading effects/failures
- Irreversibility (*Hysteresis*)

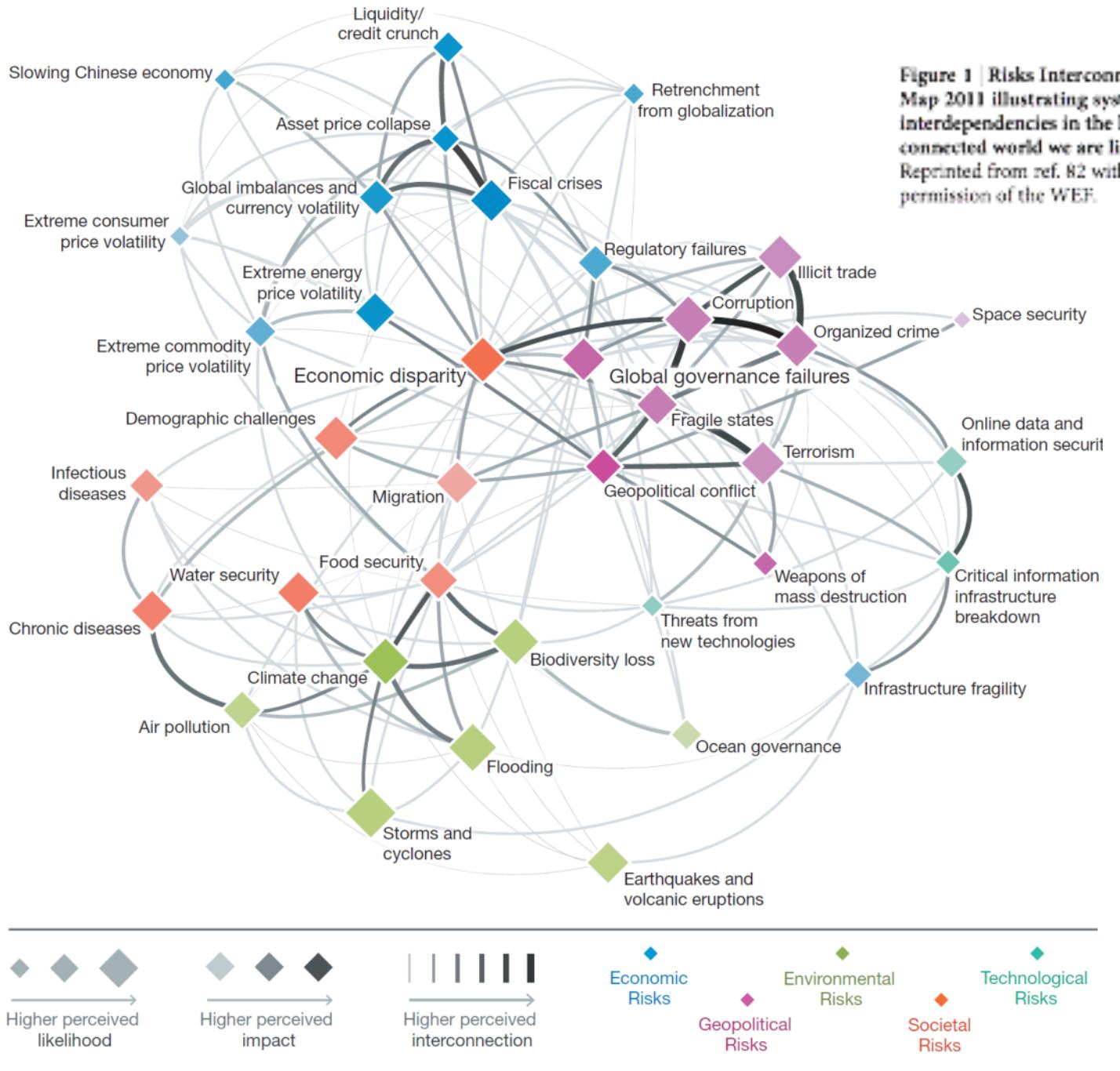
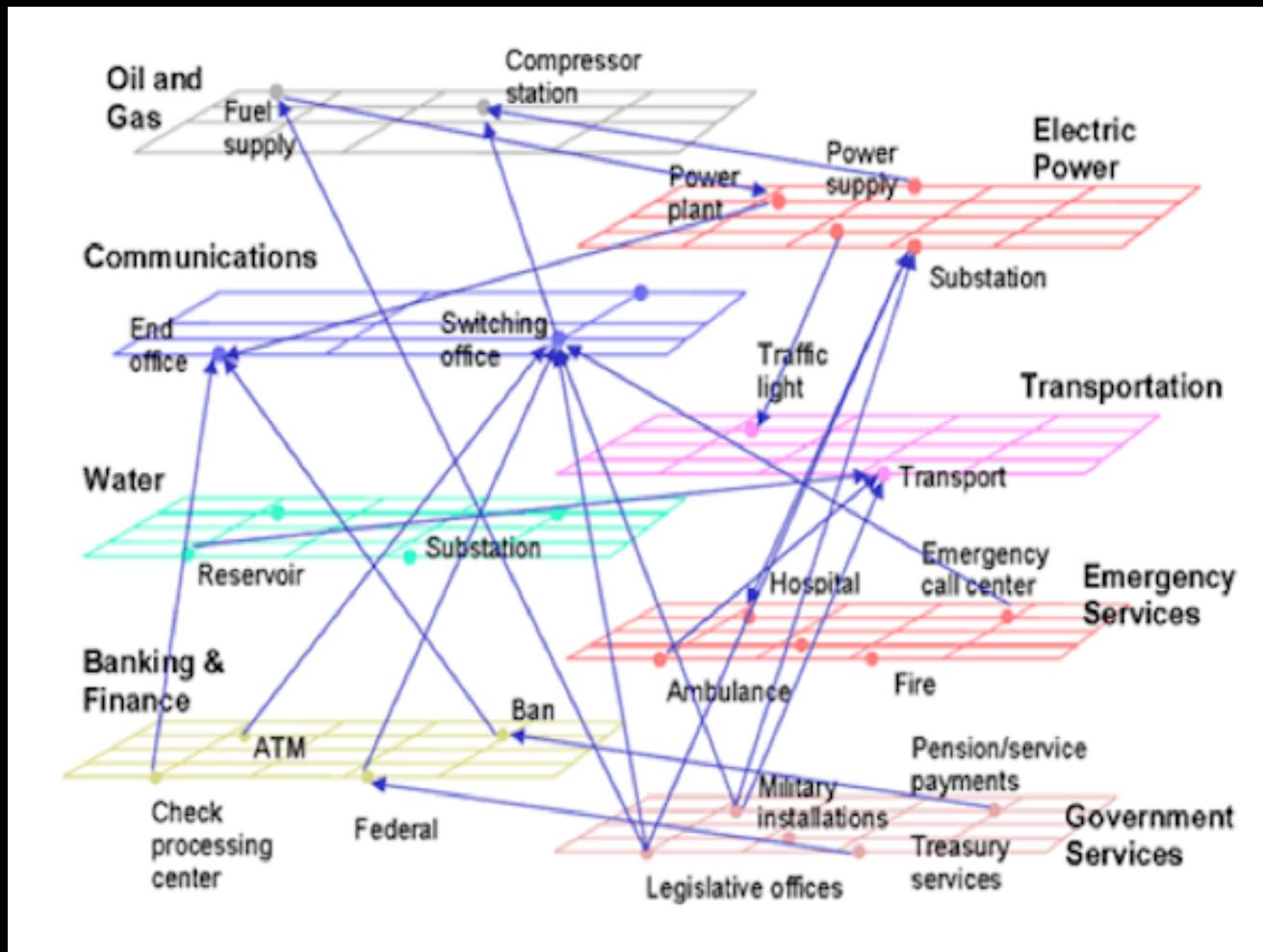
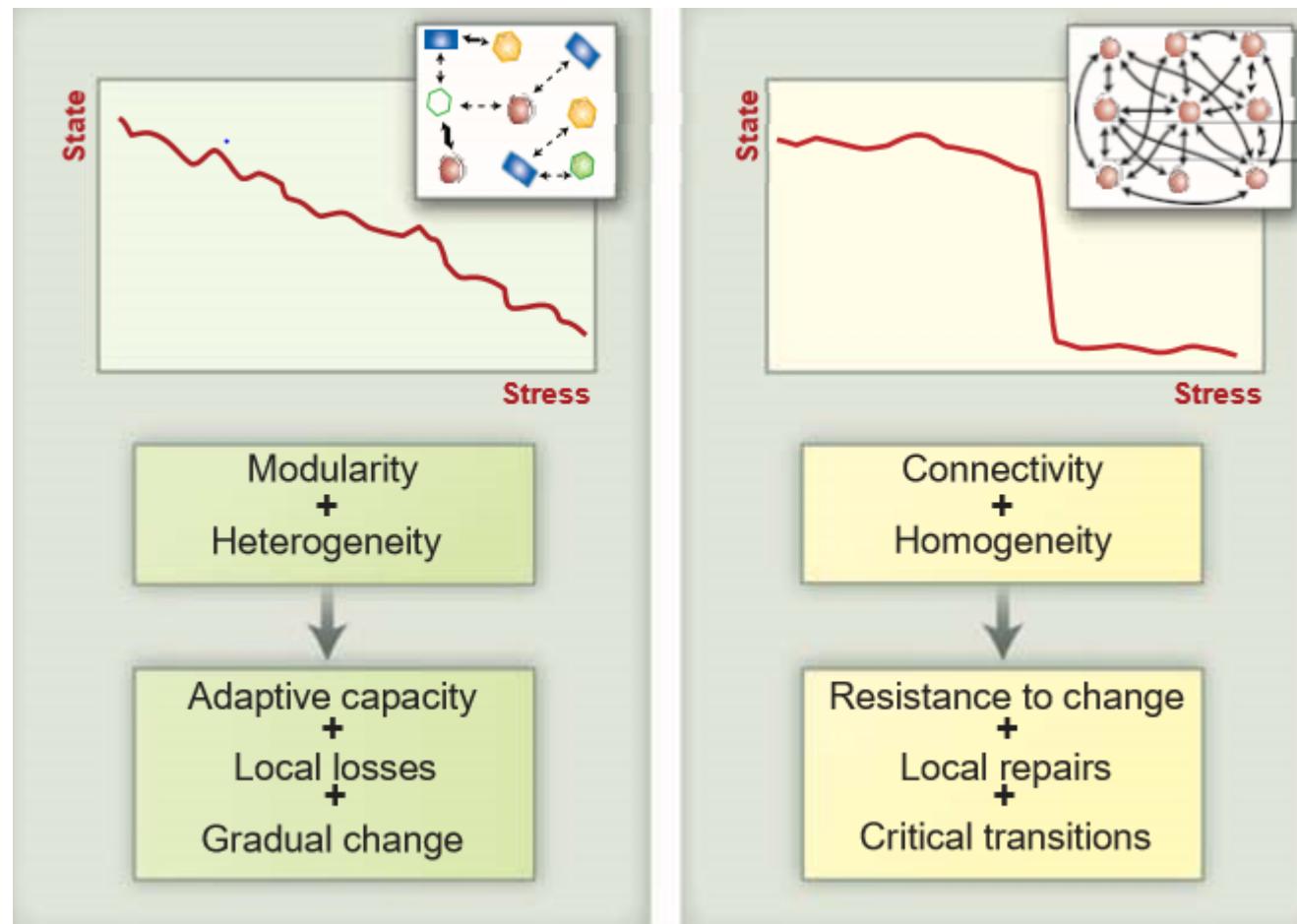


Figure 1 | Risks Interconnection Map 2011 illustrating systemic interdependencies in the hyper-connected world we are living in.
Reprinted from ref. 82 with permission of the WEF.

Supply chain contagion



Typical responses of complex systems to shocks



Habits/Behaviours

Socio-technical



Merchants of doubt

Growth imperative

Growth rates.... Falling down

M. Schmelzer / Ecological Economics 118 (2015) 262–271

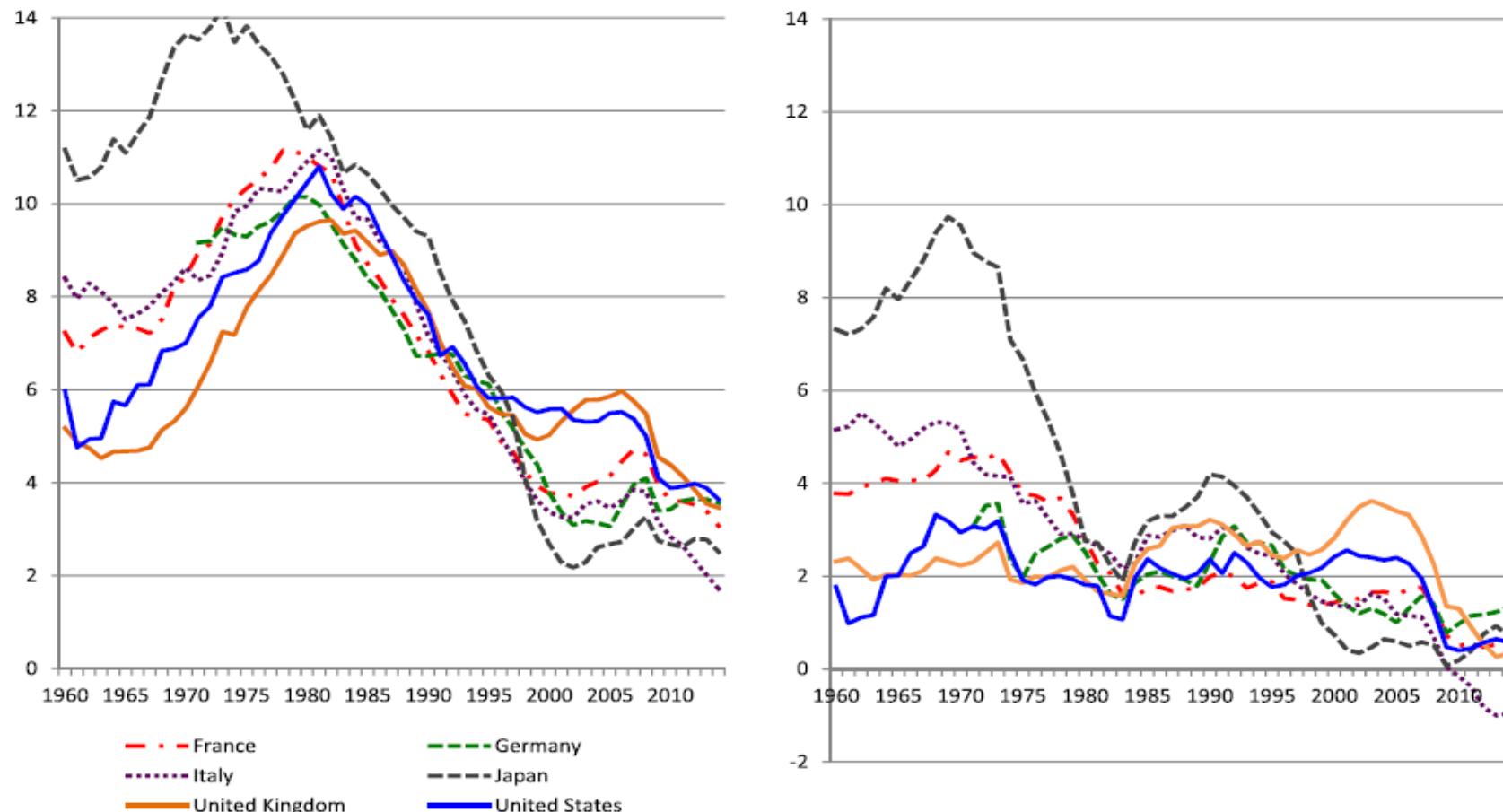


Chart 2. Nominal (left) and real (right) GDP % change on year earlier (rolling 10-year averages) in key OECD countries, 1960–2014.
Source: Penn World Tables; The Economist



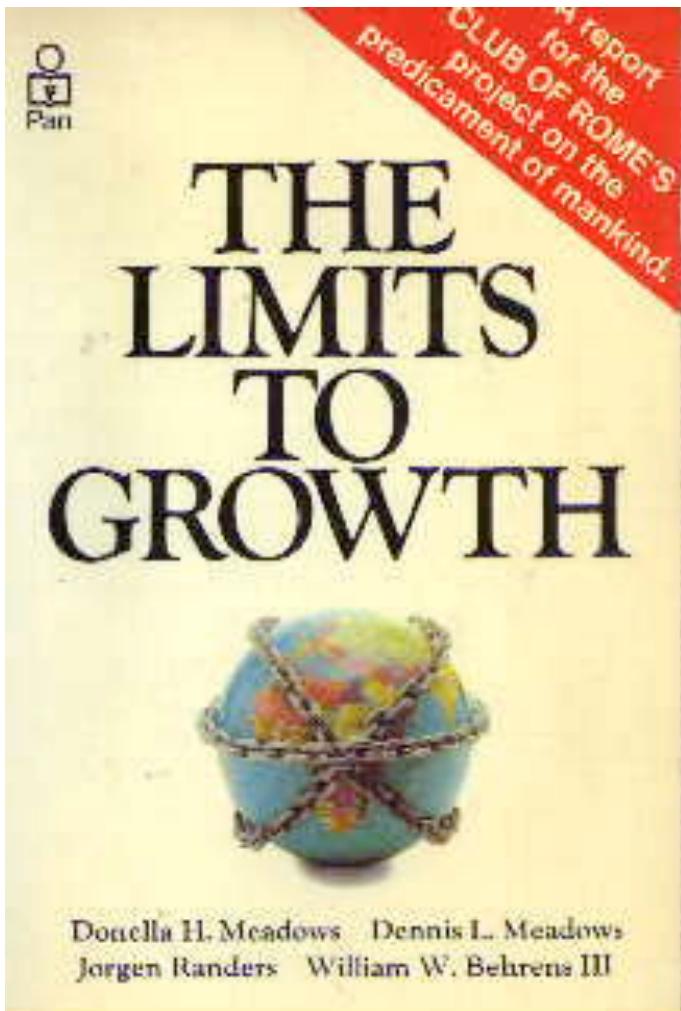
A unsolvable problem...

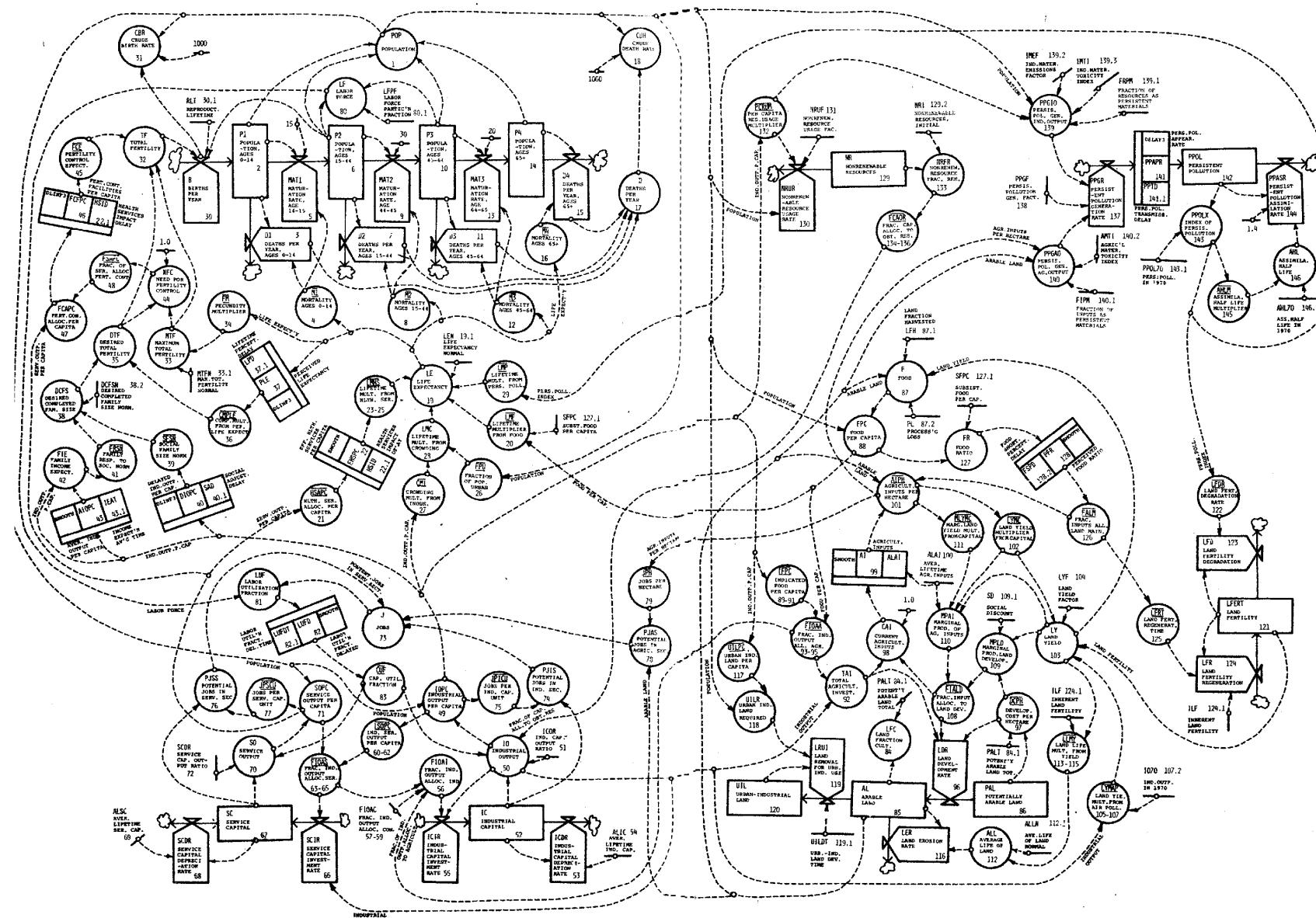
World-system

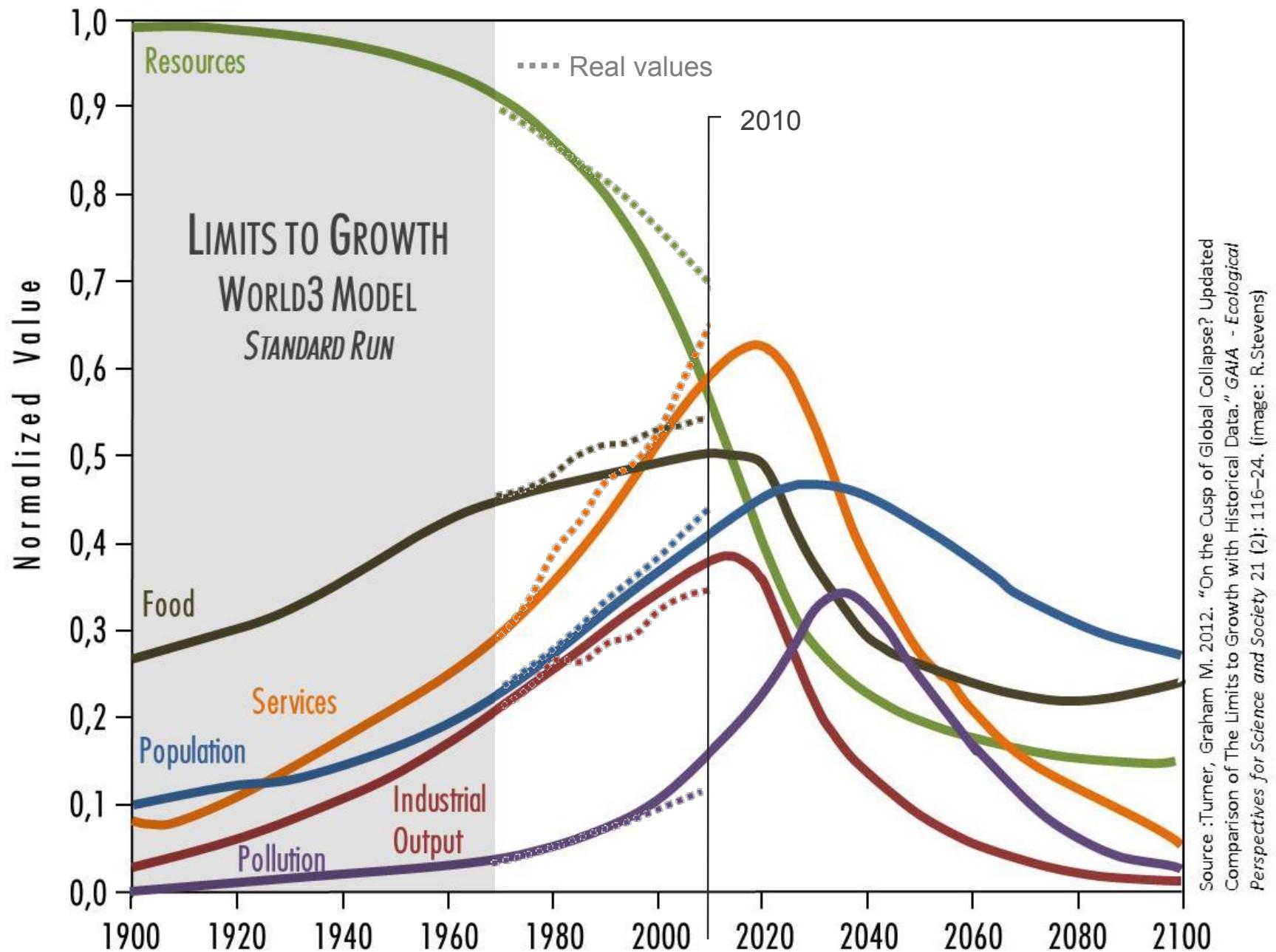
Earth-system



1972







Source :Turner, Graham M. 2012. "On the Cusp of Global Collapse? Updated Comparison of The Limits to Growth with Historical Data." *GAIA - Ecological Perspectives for Science and Society* 21 (2): 116–24. (image: R.Stevens)

A photograph of a dark-colored car driving on a paved road that curves through a valley between two large, rocky mountains. The mountains have patches of snow and vegetation. The sky is clear and blue. The road has a white dashed line.

Summary

1. Global material Growth will soon come to an end
2. The Earth-system is entering a period of big and irreversible changes (human scale)
3. Our future will be made of unpredictable shocks
4. A global systemic collapse is now a possibility

Thank you





Les 5 stades de l'effondrement

(Dmitry Orlov)

1. Financier

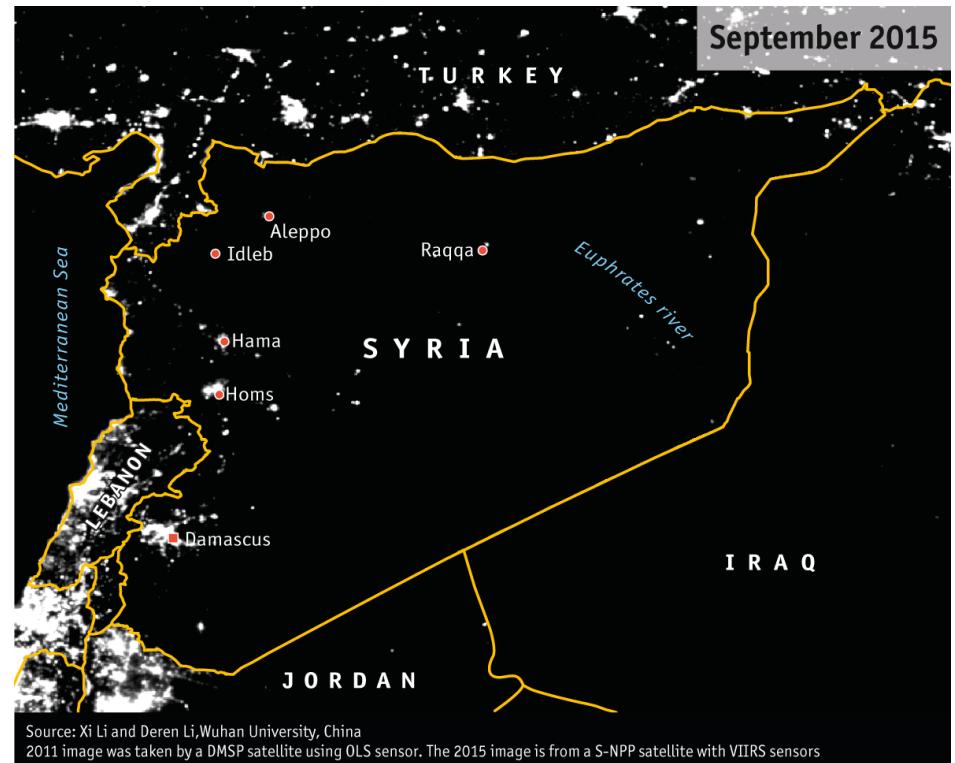
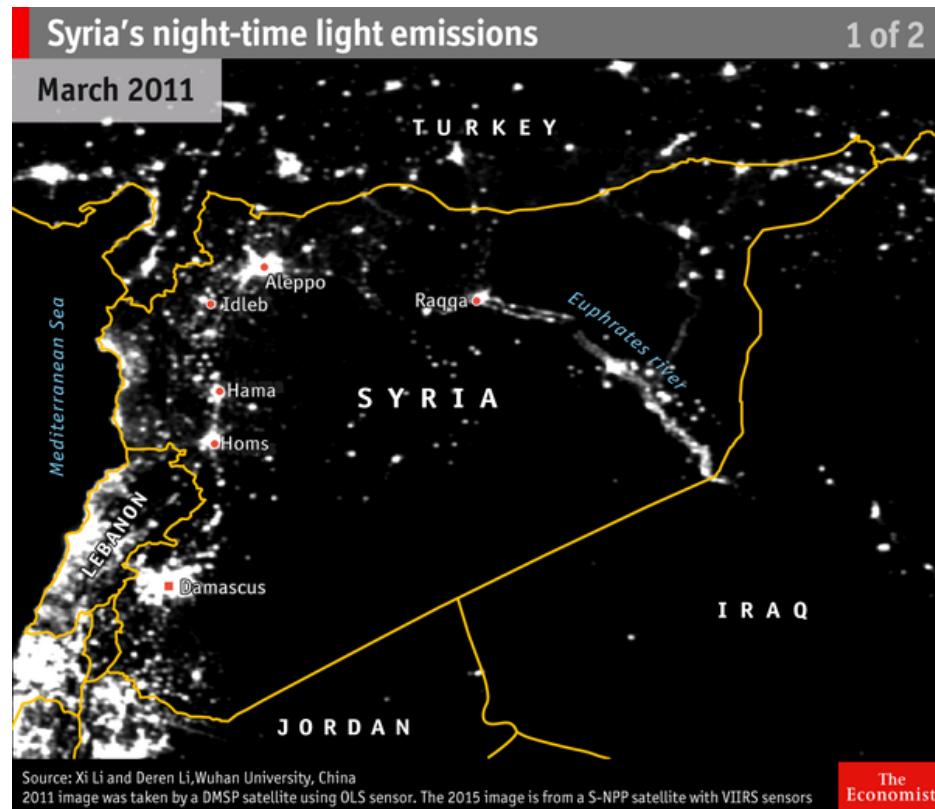
2. Economique / commercial

3. Politique

4. Social

5. Culturel

Le cas syrien



Déni

Ce n'est pas possible, pas à moi,
pas ça, pas lui, pas maintenant

Colère

Ce n'est pas juste, ils n'avaient
pas le droit, si je tenais
l'incompétent qui...

Mais qu'est-ce que je vais devenir,
je n'y arriverais jamais

Peur

L'acceptation

C'est ainsi, finalement c'est pas si mal
J'ai des nouveaux avantages, il y avait
quand même pas mal d'inconvénients

Tristesse

C'était tellement bien, je ne
connaîtrait plus jamais ça,
que c'est triste

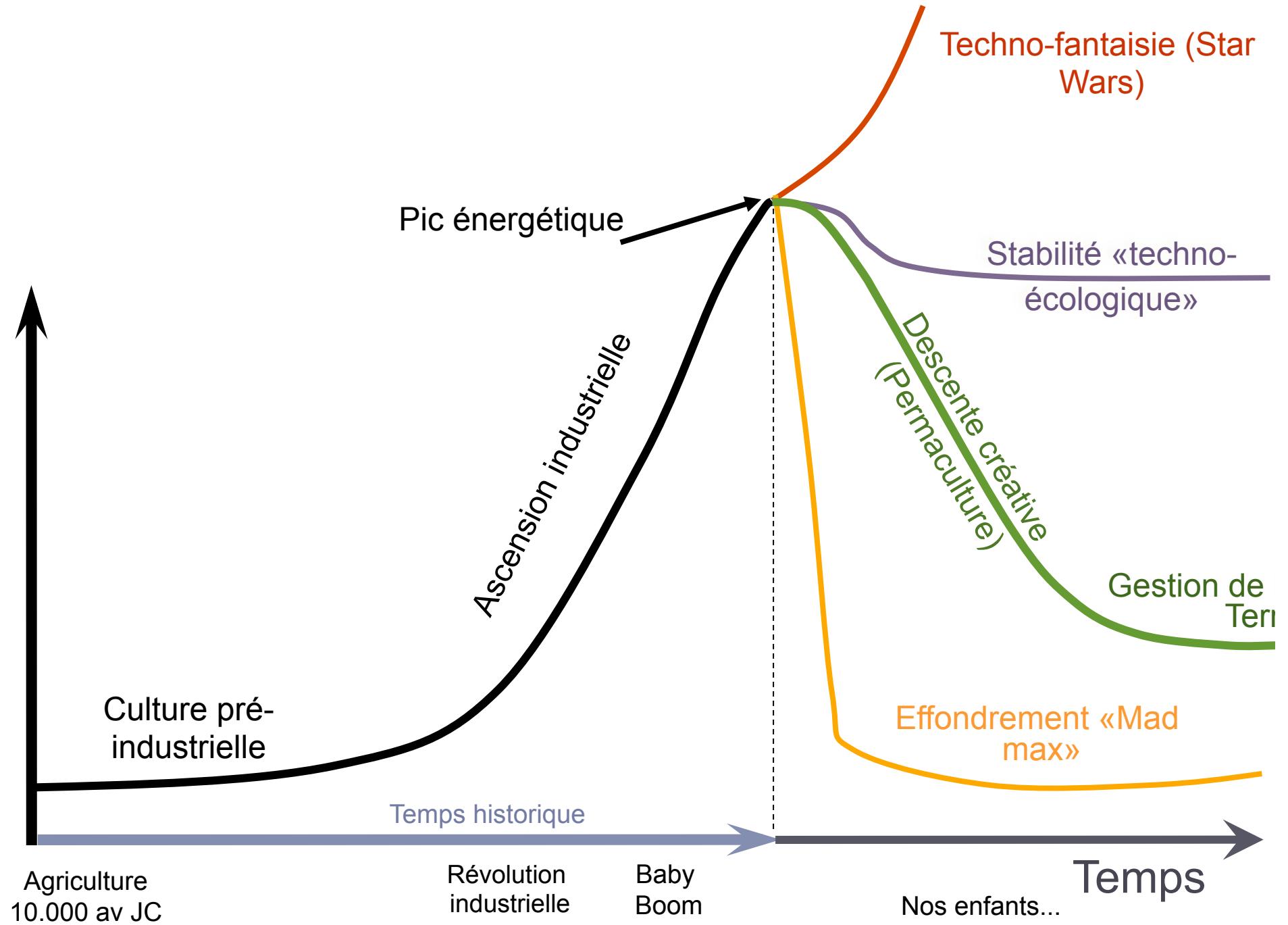
Voir, croire, accepter, imaginer...

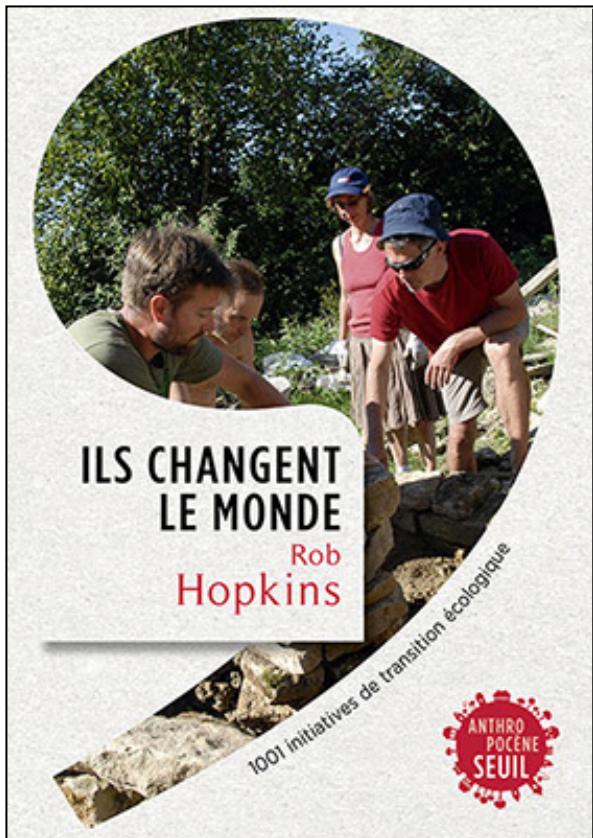


Zeitlin, 2012. *Beasts of the Southern Wild*

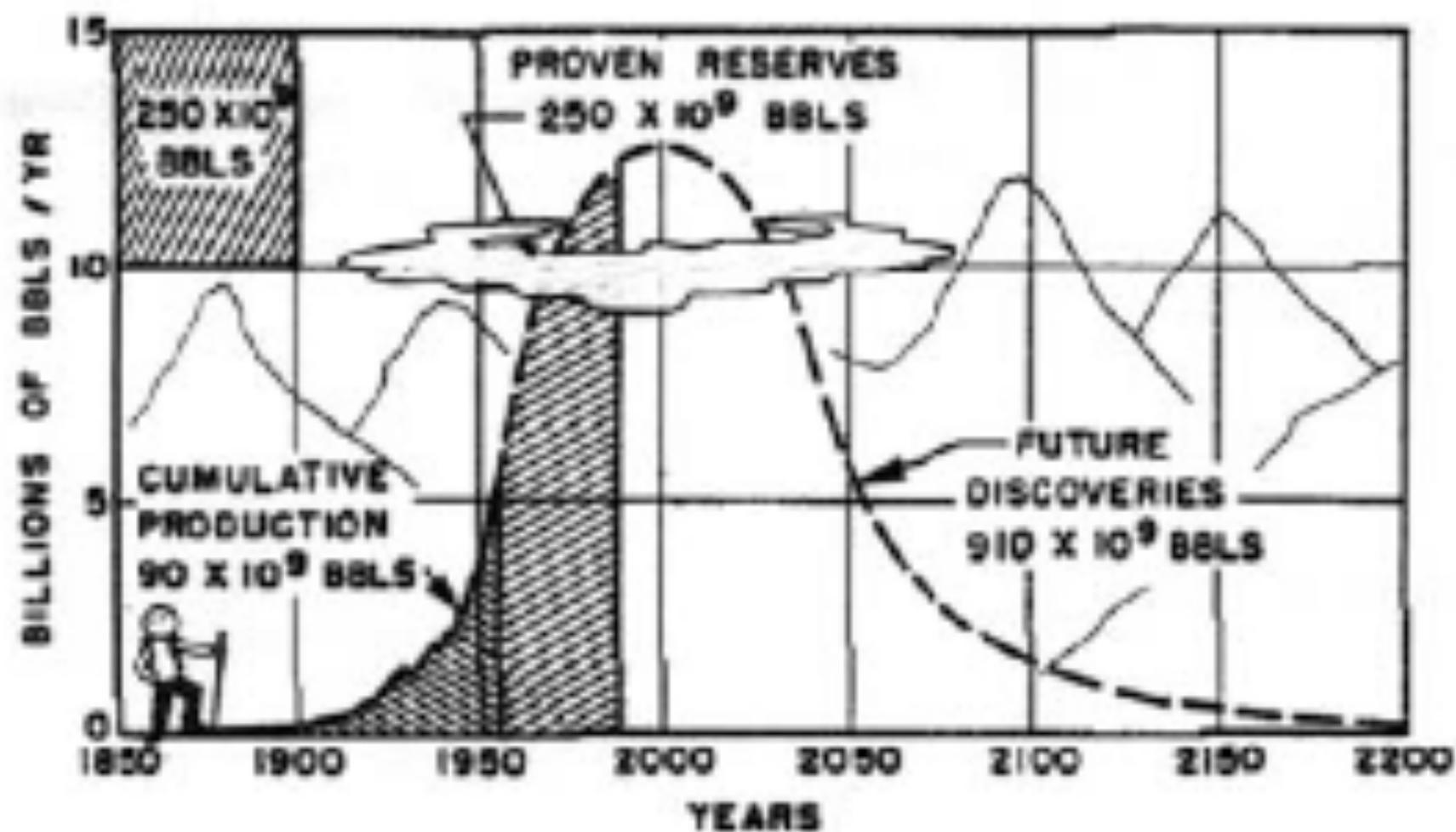


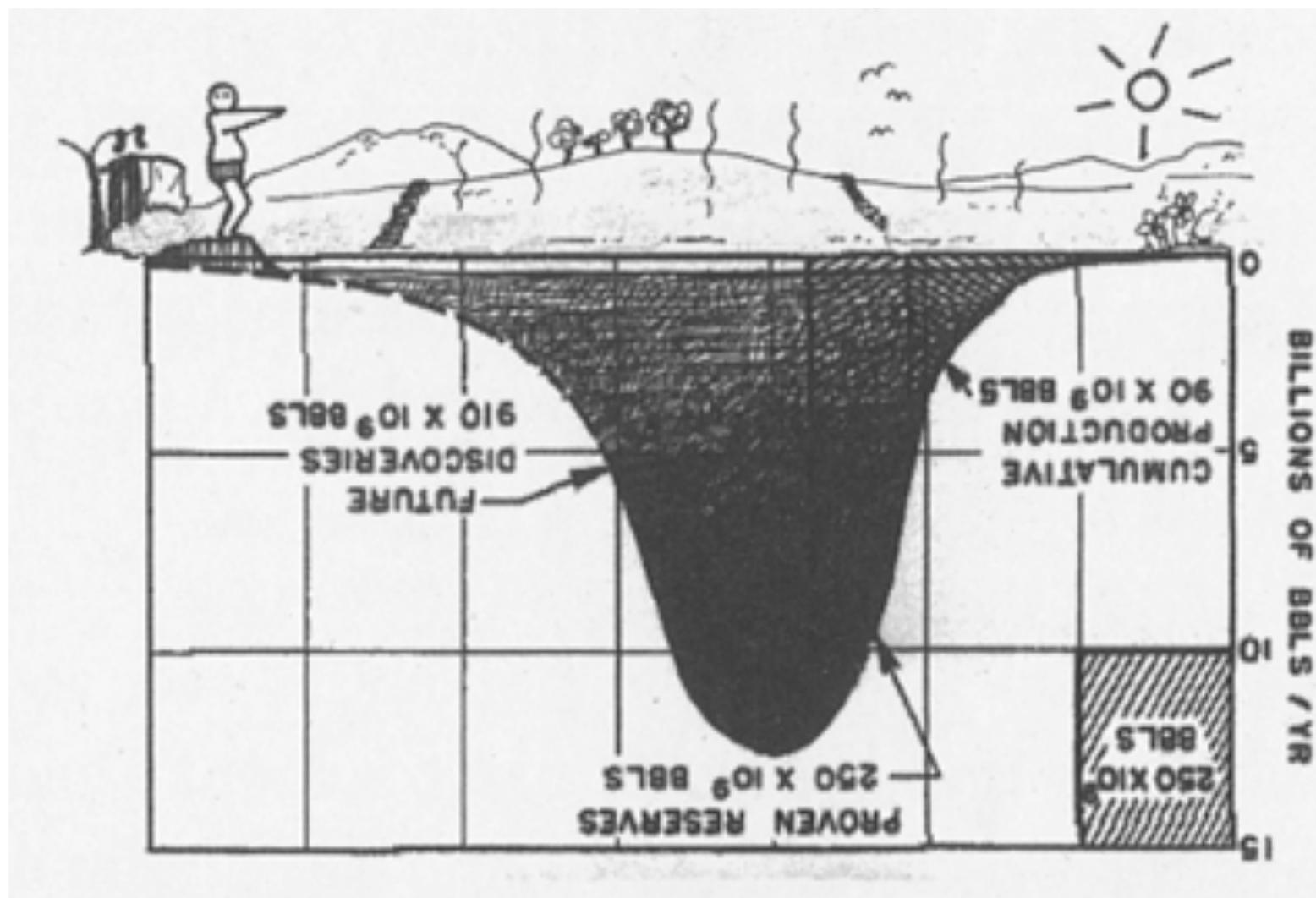






Rob Hopkins - Co-fondateur du concept de la transition





Se préparer au changement

DÉTECTOR LES FENÊTRES D'OPPORTUNITÉS

Comprendre le changement

Naviguer dans la transition
Changer de logiciel

Construire la résilience de la nouvelle direction

