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Human-made and natural architecture in the Regulatory Ecology

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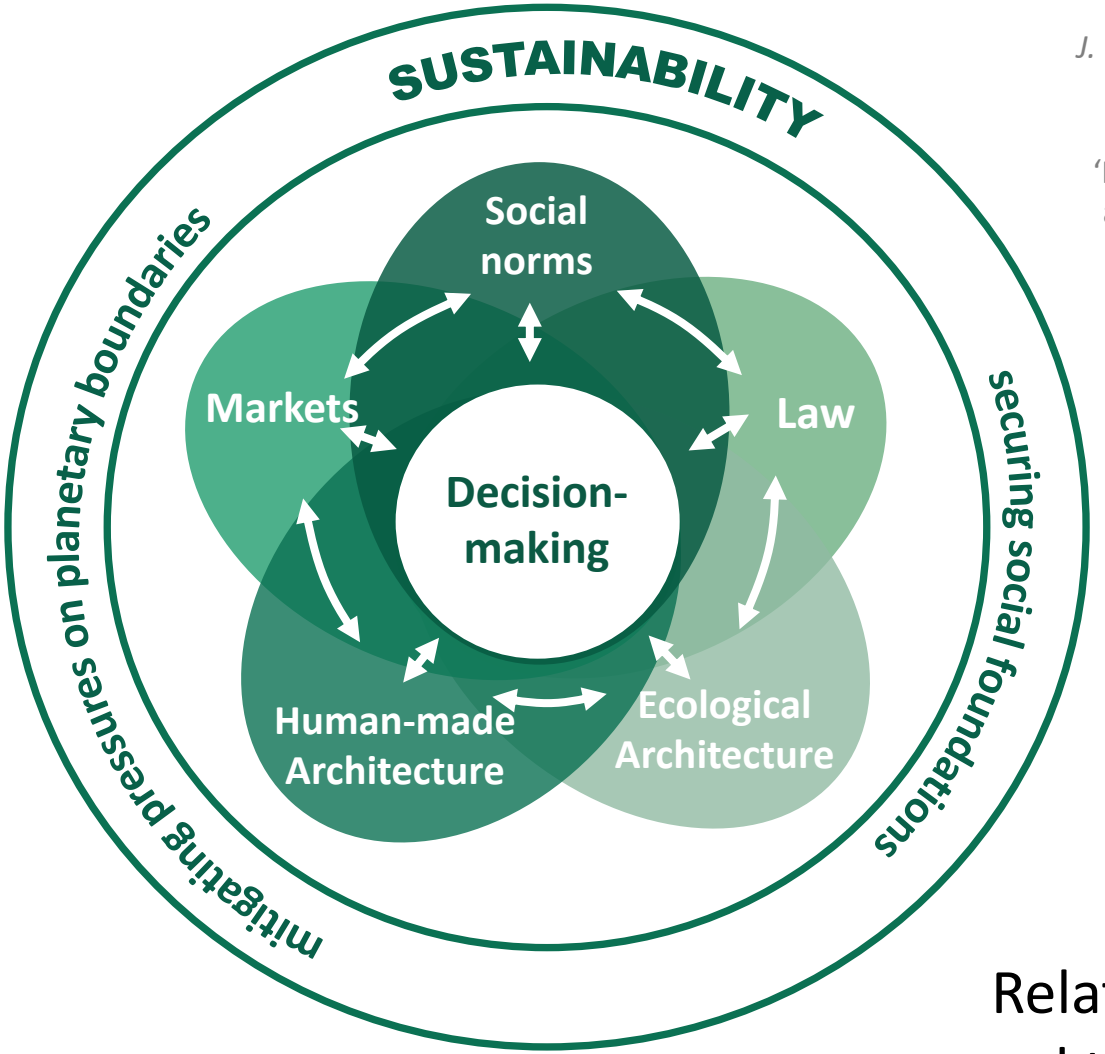
A PARTNER WITH
Beijer Institute
OF ECOLOGICAL ECONOMICS

KUNGL. VETENSKAPS AKADEMIEN
THE ROYAL SWEDISH ACADEMY OF SCIENCES



Lawrence Lessig 1998, 'The New Chicago School' *J. Legal Studies,* **27** S2, 661-691, doi:10.1086/468039

Beate Sjåfjell and Mark B. Taylor 2015, 'Planetary Boundaries and Company Law: Towards a Regulatory Ecology of Corporate Sustainability'. University of Oslo Faculty of Law Legal Studies Research Paper Series No. 2015-11

Architectures –

- Created structures
- Preconditions
- Controls

Ecologies –

Relationships of (living) entities and their (physical) surroundings

Starting premises – which may also be conclusions

"The only constant we have in life is change"

- **Sustainability governance is polycentric and dynamic**
- **Pluralism is needed in sustainability research methods and methodology**
- **Panarchy and heterarchy might help us understand change**

- **Feminist research** is vital for interdisciplinary sustainability research because it…
  - Maintains awareness of the interplay of knowledge and social changes
  - Includes attention to meanings and standpoints other than the dominant one (e.g., historically excluded women's experiences, marginalised peoples)
  - Uses transdisciplinary methodologies to reflect plural perspectives

bell hooks 2000 'Feminism is for everybody'; Chimamanda Ngozi Adichie 2015 ' We should all be feminists'

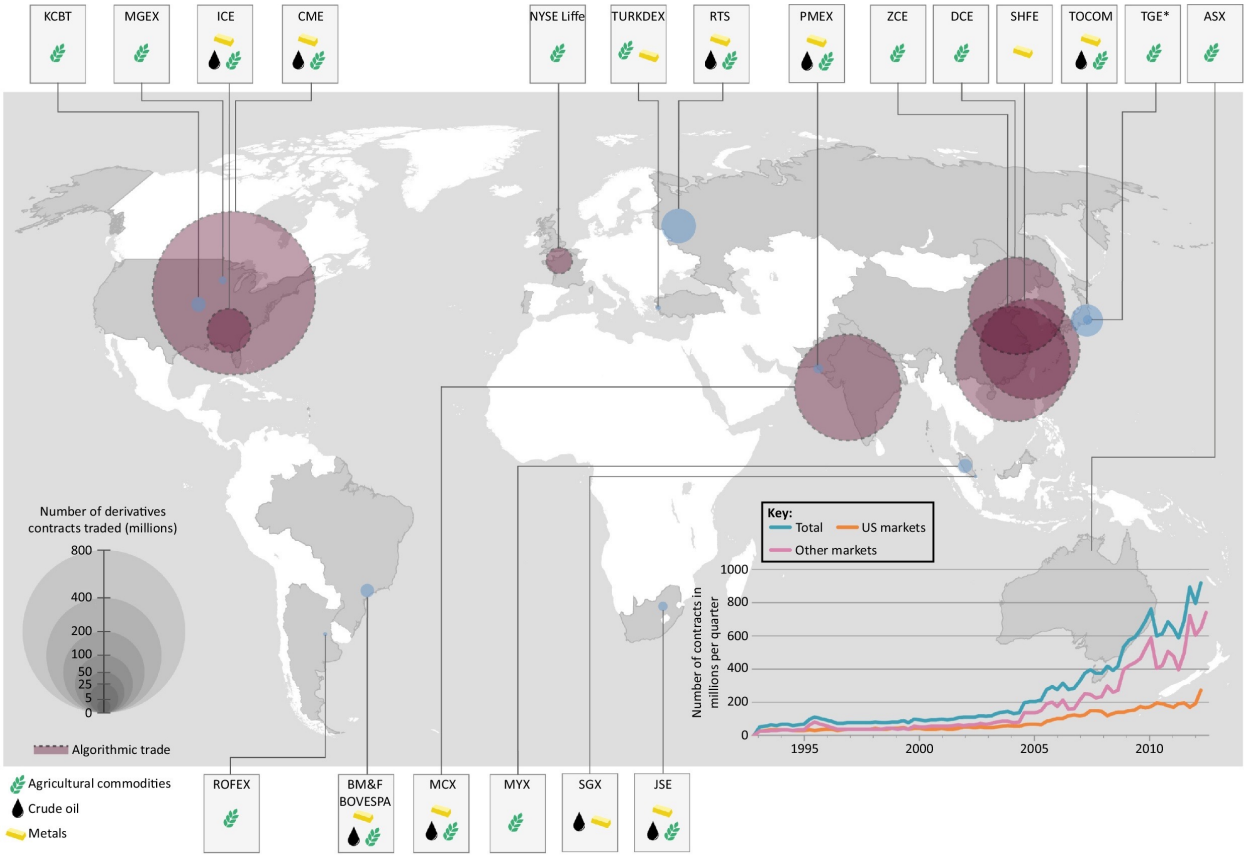
Galaz, V. and Pierre, J. 2017. Superconnected, Complex and Ultrafast: Governance of hyperfunctionality in financial markets. *Complexity, Governance & Networks* 3(2): 12-28. http://dx.doi.org/10.20377/cgn-55

Galaz et al 2015 Why ecologists should care about financial markets. *Trends in Ecology & Evolution* 30(10): 571-580

Human-made architecture

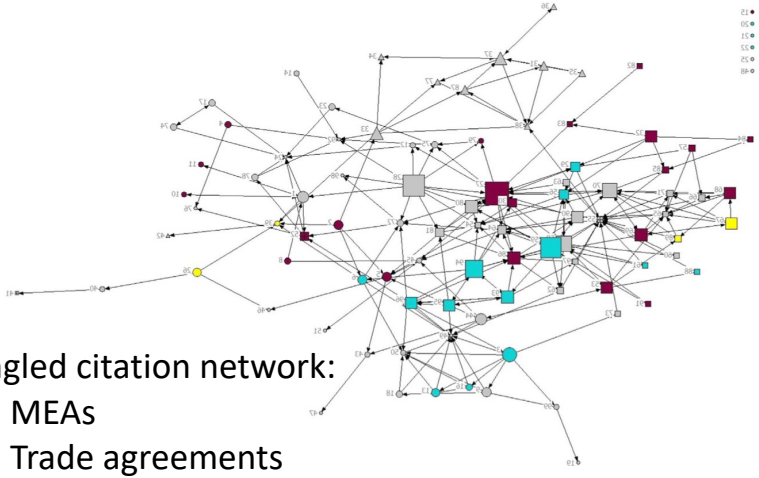
Mapping the development of ultrafast market information processing and analysis technologies with commodities (and living ecosystems):

16 of the 20 largest commodity derivatives markets worldwide use algorithmic trade



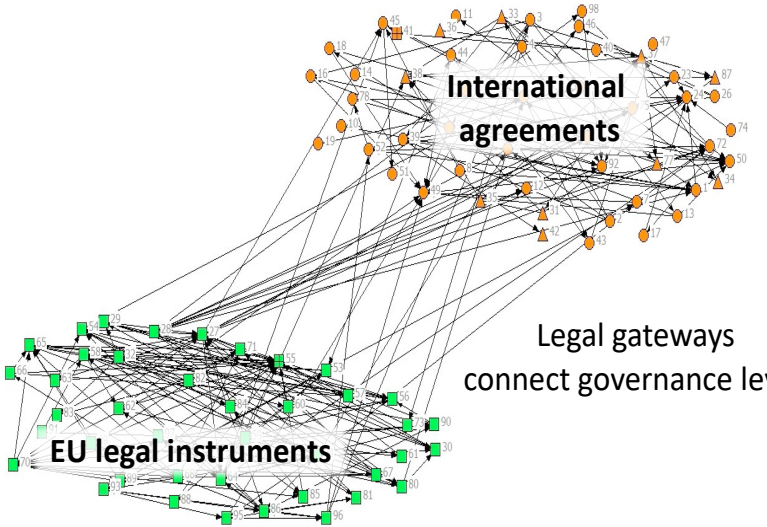
Human-made architecture

Biermann (2007) talks of the ‘architecture’ of global governance systems.
We can study these macro-level systems of institutions using network analysis.
Ahlström and Cornell (2018) analysed the polycentric order of nutrient management policy



Tangled citation network:

- MEAs
- Trade agreements
- Legal instruments (EU, etc)



Legal gateways connect governance levels

Frank Biermann (2007) ‘Earth system governance’ as a crosscutting theme of global change research. *Global Environ. Change* 17, 326–337; https://doi.org/10.1016/j.gloenvcha.2006.11.010

Hanna Ahlström & Sarah Cornell (2018) Governance, polycentricity and the global nitrogen and phosphorus cycles. *Environmental Science and Policy* 79 (2018) 54–65 http://dx.doi.org/10.1016/j.envsci.2017.10.005

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climate, energy and fossil fuel industry

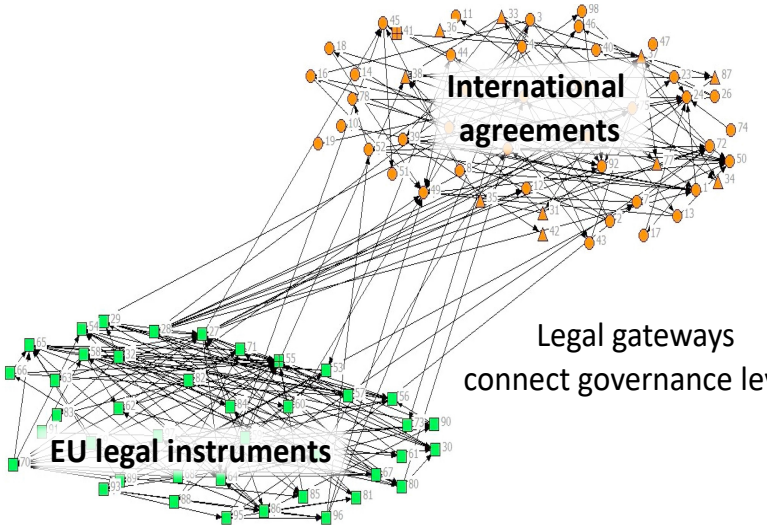
water

Nutrient (N&P) governance

air quality

industrial production

habitats



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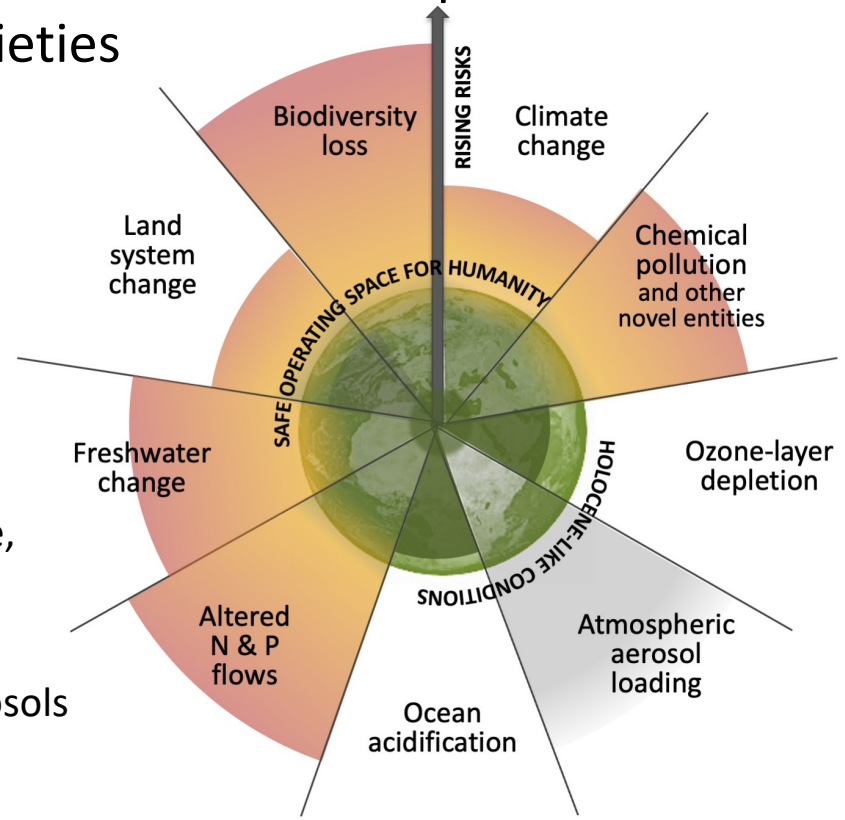
EAA (2015) *The European environment: state and outlook 2015: assessment of global megatrends.*
Blackrock (2019) *Megatrends: The forces shaping our future.*

Ecological architecture

- Large-scale, long-term forces that can transform the priorities and trajectories of the world's societies

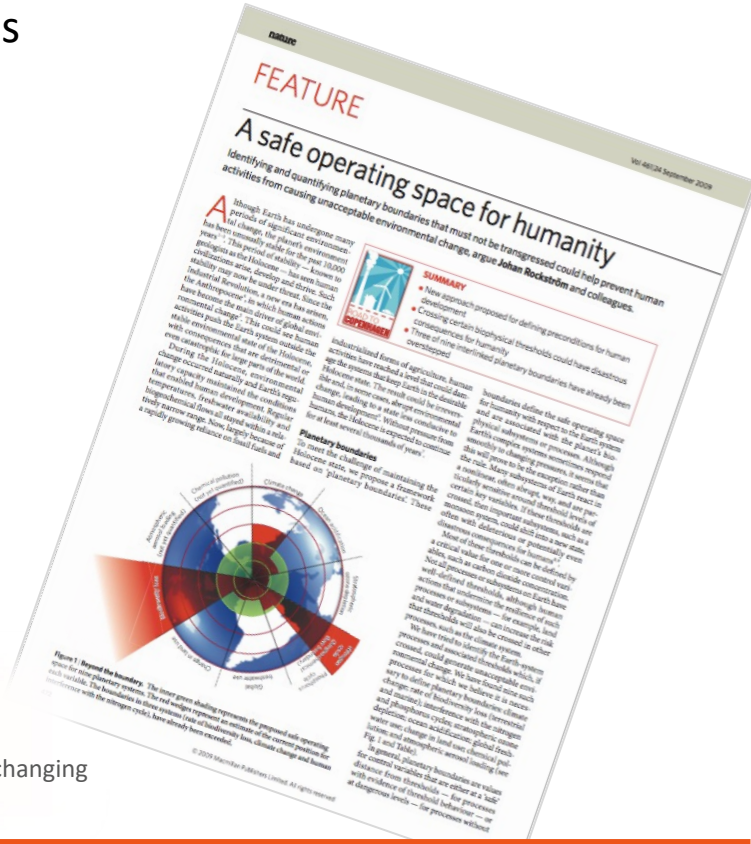
→ planetary boundaries framework



- Climate change and ocean acidification
- Biodiversity loss
- Natural resource use – freshwater and land use, and land system change
- Environmental flows of chemical pollution, nutrient elements (N&P) and atmospheric aerosols

The planetary boundaries framework is influential

- A core part of a discourse of imposed constraints, control, targets
- Growing range of business and policy applications
- Catalyzing new scientific agendas
- Issues *ARE* critical, harms *ARE* actual and severe
- Uncertainties *ARE* complex and substantial


nature

FEATURE

A safe operating space for humanity

Identifying and quantifying planetary boundaries that must not be transgressed could help prevent human activities from causing unacceptable environmental change, argue Johan Rockström and colleagues.

SUMMARY

Rockström and 21M and 7F co-authors (2009; 25%) 'A Safe Operating Space for Humanity': research article in *Ecology & Society*, discussion article in *Nature.*

Steffen and 9M and 8F co-authors (2015; 44%) 'Planetary Boundaries: guiding human development on a changing planet': published in *Science www.sciencemag.org/lookup/doi/10.1126/science.1259855*

Climate change

1992 - UN Framework Convention on Climate Change: objective is to stabilize greenhouse gas concentrations ***"at a level that would prevent dangerous anthropogenic interference with the climate system"*** **360 ppm**

…within a time-frame that allows ecosystems to adapt naturally, ensures that food production is not threatened, and enables economic development to proceed in a sustainable manner.

1997 – Kyoto Protocol committed parties to limiting and reducing emissions **363 ppm**

- Binding targets, monitoring, review and verification, market mechanisms

2007 – Bali Road Map highlighted challenges of cooperative action **383 ppm**

→ Adaptation fund (2008), nationally appropriate mitigation actions (2009)

2015 – Paris Agreement **400 ppm**

→ Nationally Determined Contributions (2020) – voluntary, multi-actor

Now: 414 ppm

Mace et al 2018, Aiming higher to bend the curve of biodiversity loss.
Nat Sustain 1, 448–451 (2018). https://doi.org/10.1038

Biodiversity loss

1992 - UN Convention on Biological Diversity:

objective is “the conservation of biological diversity,
the sustainable use of its components and
the fair and equitable sharing of the benefits arising out
of the utilization of genetic resources”

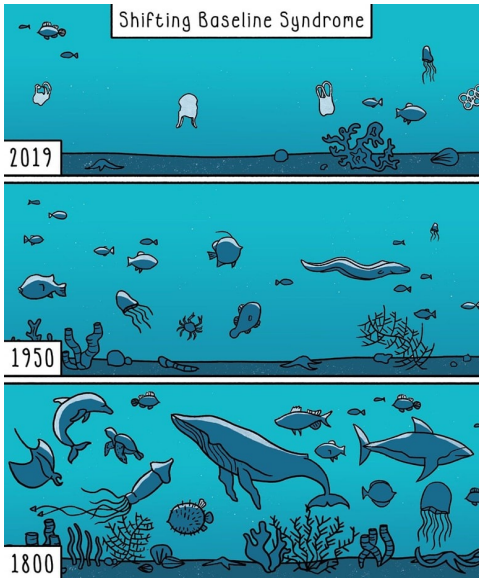
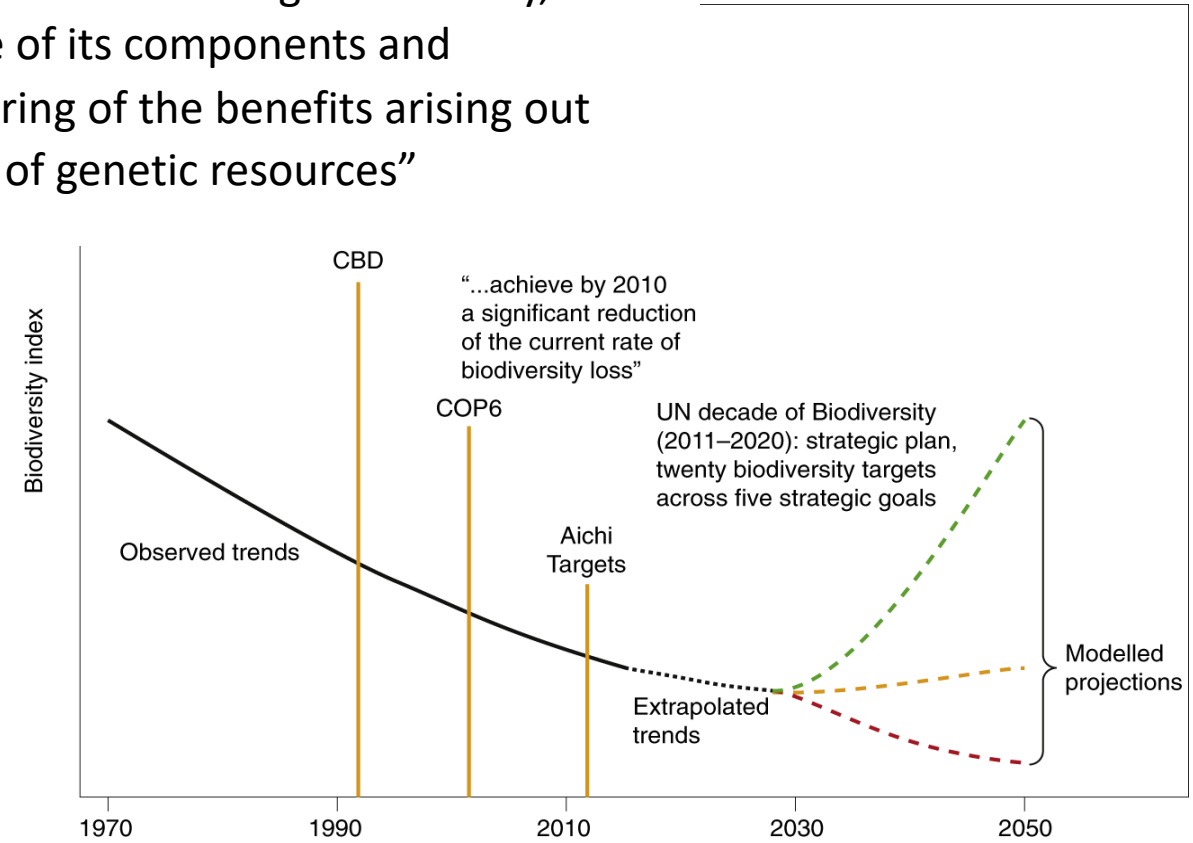


Image by Cameron Shepherd, via Twitter



Nykvist et al. (2013) National responsibility (SEPA/SEI/SRC); Cornell and Downing (2014) Environment, Absolute? (PTB)

The planetary boundaries concept builds on knowledge about global processes that *already* present global risks

Issue	Global assessments	Policy structures
Climate change	IPCC AR **1990, 1995, 2001, 2007, 2014, 2021**; SRES; UNHDR…	IPCC, UNFCCC SBSTA Many international conventions
Biodiversity destruction	MA 2005; CBD GBO1-3; UNEP GEO1-5; TEEB; FAO…	IPBES and CBD SBSTTA CBD, CITES, other conventions
Natural resource (mis)use	UNEP GPNM 2013; WMO/IAEA/UNEP GESAMP reports	WHO, FAO, WMO, IPCC, GPRI, INI, GPNM. Several conventions.
Pollution and waste	UNEP Chemicals Outlook, AMAP and other regional	SETAC, SCI, WHO-IFCS, Many conventions.

Miller's four social mechanisms by which environmental knowledge, values and policy are framed:

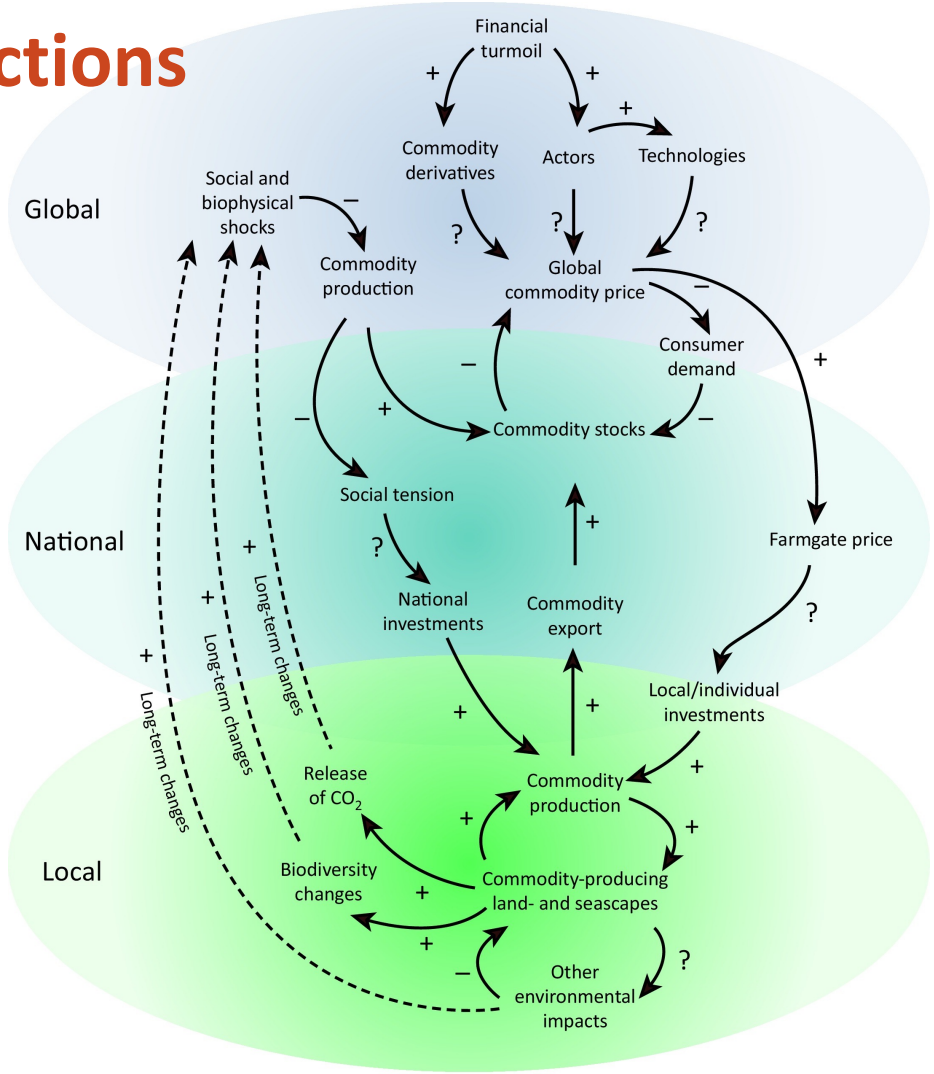
- ***Modelling*** – the ways decisions are made about what to *simplify* and what to *specify* shape collective understandings.
- ***Narrative*** – the ways sustainability stories are told embed values in 'science questions', often slipping into forms that sound coherent and complete.
- ***Canonisation*** – the ways in which a knowledge perspective aligns with existing channels of influence shapes its chances of being adopted as authoritative.
- ***Normalisation*** – the ways in which a concept or discourse becomes embedded in routine activity (of a state, a business or any other societal institution) tacitly gives it credence, and tends to shut down opportunity to consider other perspectives.

Miller, C.A. (2000). The dynamics of framing environmental values and policy: Four models of societal processes. *Environ. Values*, 9, 211–233,

Regulatory ecology interactions

Architectures are ‘rigid’ structures – non-negotiable, automatic

…yet also sources of ‘predictable surprise´



https://www.resalliance.org/panarchy

Gunderson and Holling 2002 *Panarchy: Understanding Transformations in Human and Natural Systems*. Island Press

Bazerman 2006 Climate change as a predictable surprise. *Climatic Change* 77: 179–193 doi:10.1007/s10584-006-9058-x

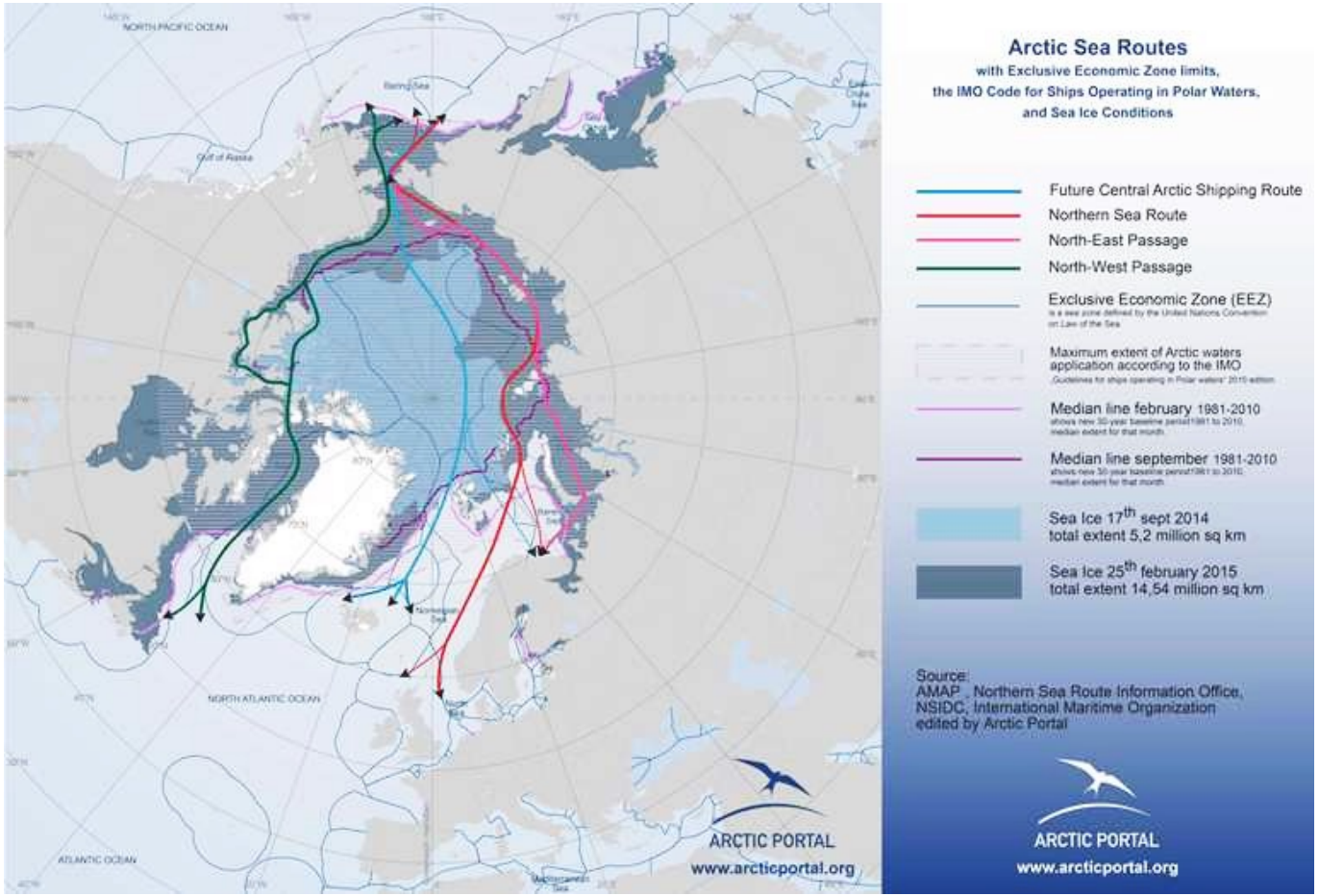
Galaz et al 2015 Why ecologists should care about financial markets. *Trends in Ecology & Evolution* 30(10): 571-580

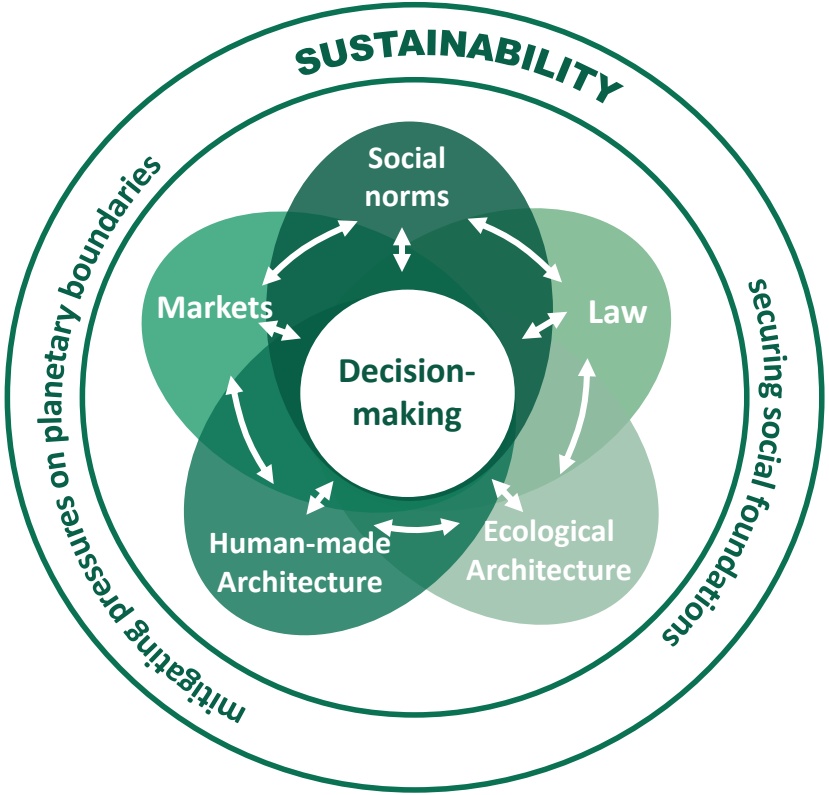
Regulatory ecology interactions

Arctic ice will melt if climate change is not mitigated

Shipping route attempts pollute and break ice and accelerating melting

Climate change and social norms interact to rearrange biomes, geopolitics and macroeconomies





Does this help in theory?

Does this help in research practice?

Does this help in real-world practice?