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ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΙΓΑΙΟΥ



Ευρωπαϊκή Ένωση
Ευρωπαϊκό Κοινωνικό Ταμείο



ΕΠΙΧΕΙΡΗΣΙΑΚΟ ΠΡΟΓΡΑΜΜΑ
ΕΚΠΑΙΔΕΥΣΗ ΚΑΙ ΔΙΑ ΒΙΟΥ ΜΑΘΗΣΗ
επένδυση στην κοινωνία της γνώσης
ΥΠΟΥΡΓΕΙΟ ΠΑΙΔΕΙΑΣ ΚΑΙ ΘΡΗΣΚΕΥΜΑΤΩΝ
ΕΙΔΙΚΗ ΥΠΗΡΕΣΙΑ ΔΙΑΧΕΙΡΙΣΗΣ

Με τη συγχρηματοδότηση της Ελλάδας και της Ευρωπαϊκής Ένωσης



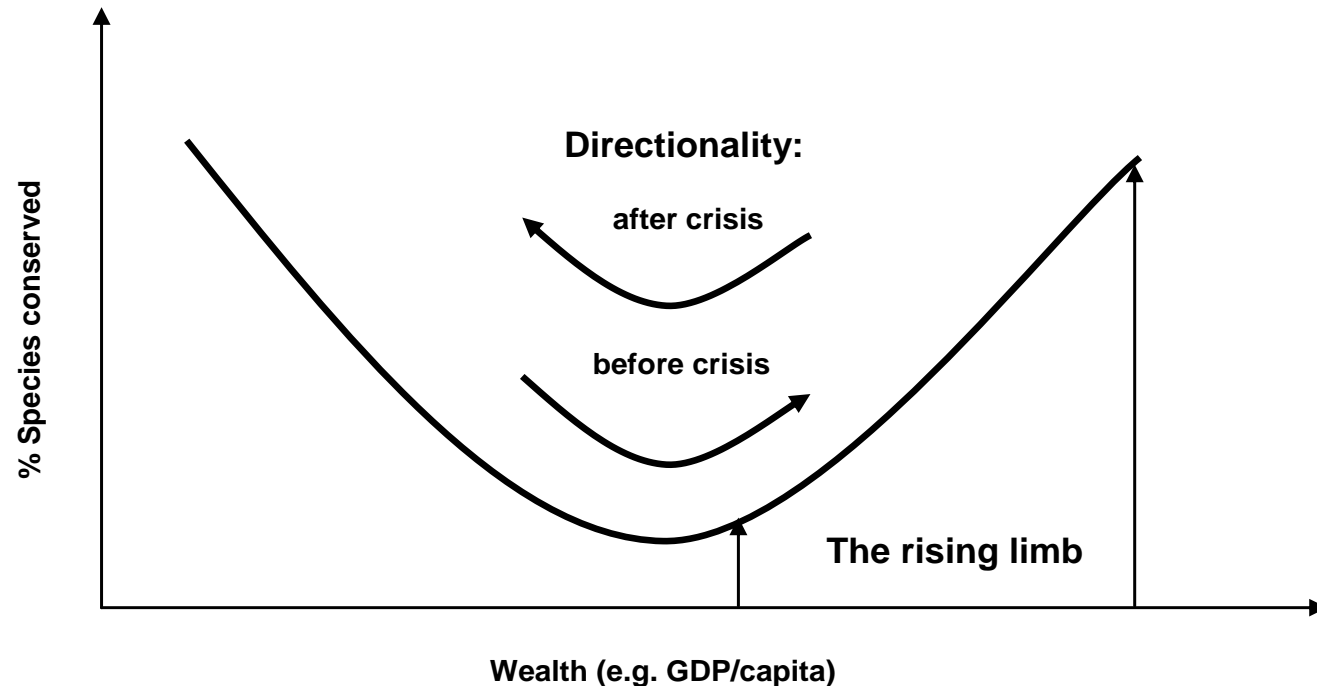
ΕΥΡΩΠΑΪΚΟ ΚΟΙΝΩΝΙΚΟ ΤΑΜΕΙΟ

ΠΕΓΑ: Βιοτικοί Πόροι- Τεχνικές Μελέτης και Αξιολόγησης

Διαχείριση τίνος πράγματος...;

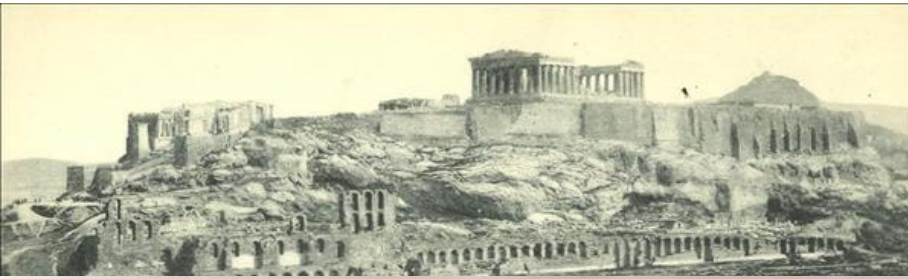
Ανδρέας Τρούμπης
Καθηγητής Οικολογίας

2014-2015



Η πράξη «Περιβαλλοντική Διαχείριση-Σύγχρονα Εργαλεία», του Επιχειρησιακού Προγράμματος «Εκπαίδευση και Δια Βίου Μάθηση», συγχρηματοδοτείται από την Ευρωπαϊκή Ένωση (Ευρωπαϊκό Κοινωνικό Ταμείο-ΕΚΤ) και από Εθνικούς Πόρους.

An empirical story on Athens urban air quality



Athens, 1850-1920



**Athens, 1980-1990:
Photochemical smog**



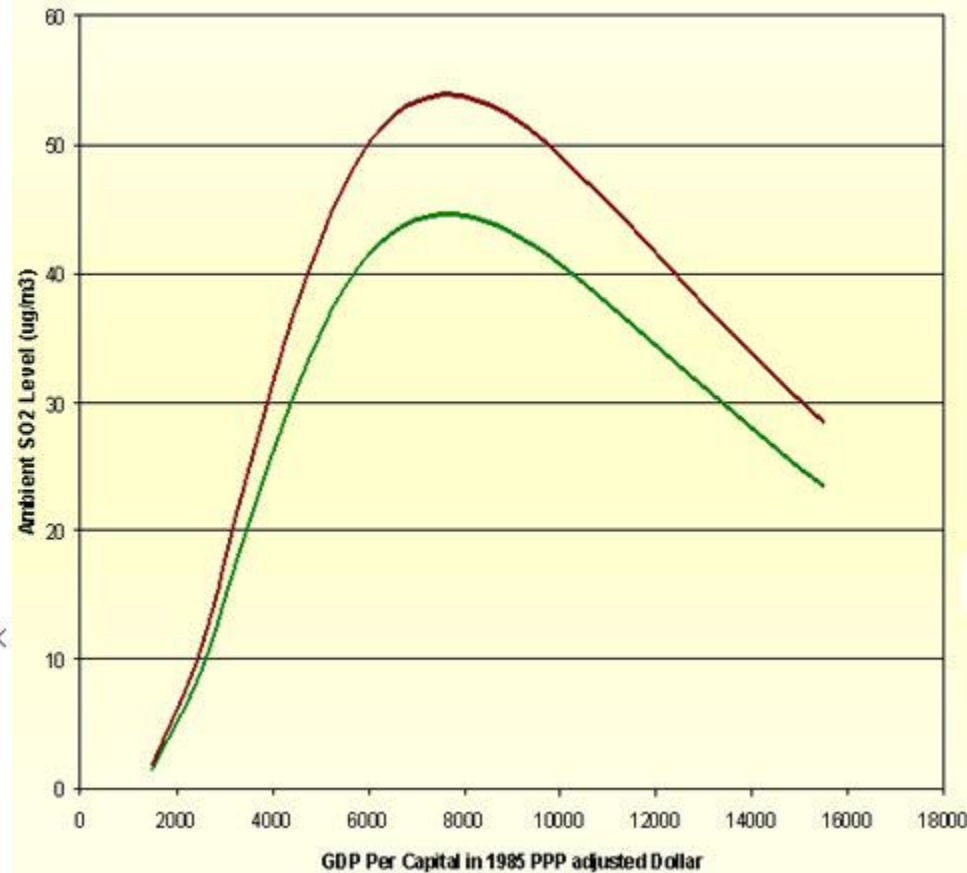
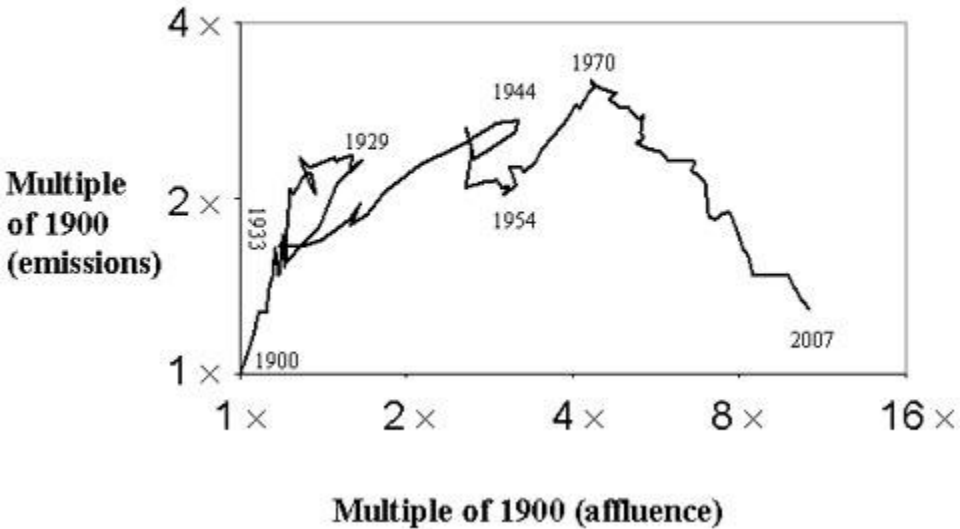
**Athens, 2000-2008:
Dust cloud from Africa**



**Athens, 2012-2013:
Solid particulate "cloud"**

Standard theory predicts an inversed U-shape Kuznets curve between air pollution level and GDP/capita

Environmental Kuznets Curve for USA sulfur dioxide emissions



One Country vs. Time

Cross-country comparisons

The liberal narrative: Economic growth can contribute to enhancing environmental protection measures and to improving environmental quality ... Affluent societies seek to improve their quality of life and their living environments, and policies and regulations are developed to meet these goals ...

(*Nelson et al., 2005*).

But, standard theory can't predict or incorporate abrupt economic turndowns, transient disruptions or extreme fluctuations in driving forces



**Athens, 1980-1990:
Photochemical smog**



**Athens, 2012-2013:
Solid particulate "cloud"**

**Athens' urban air quality is a dependent proxy
of the economic status of a Nation:**

"Smog" is the indicator of growth, the "cloud" is the indicator of recession!

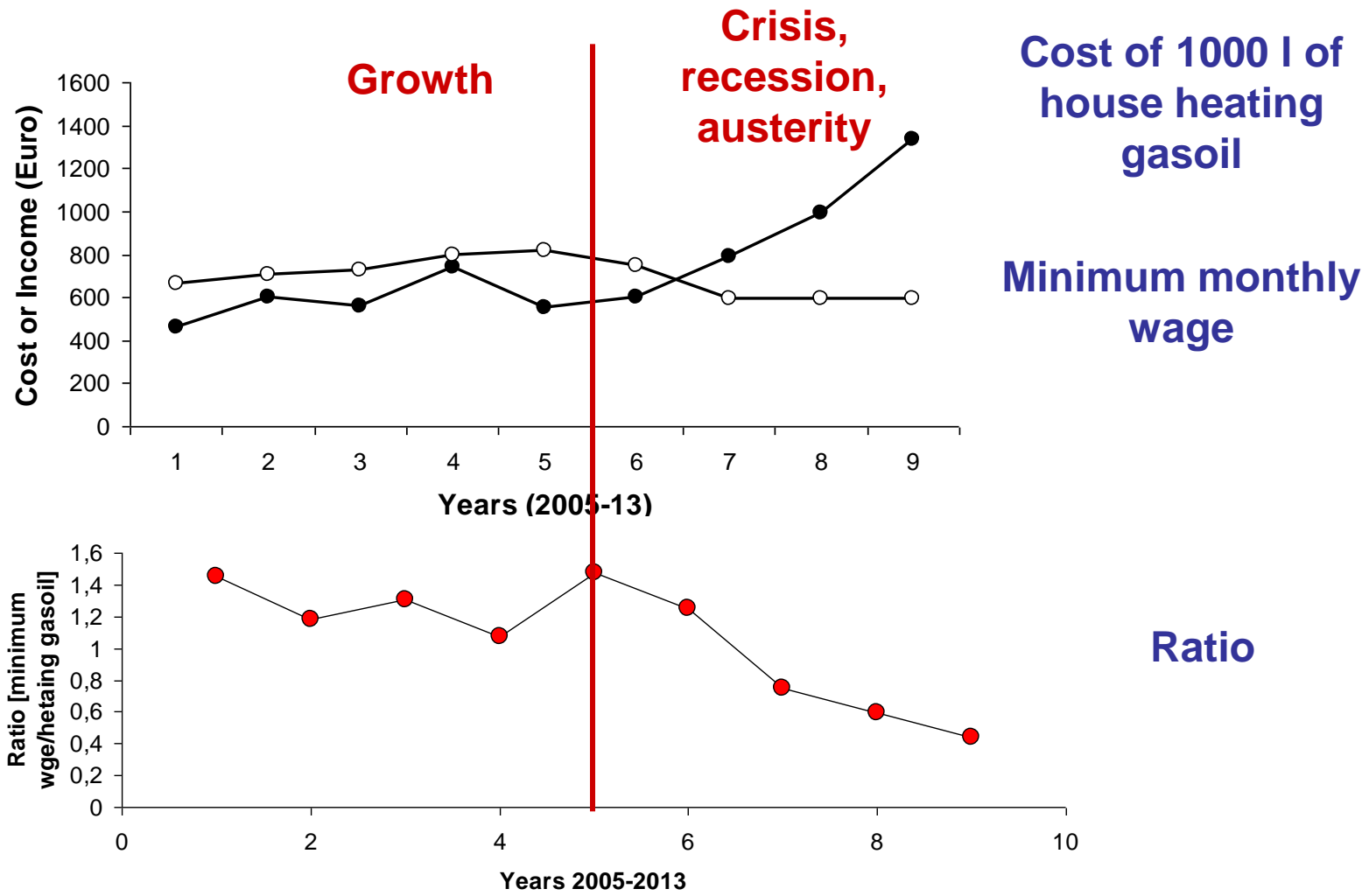
Are there lessons for the mainstream biodiversity conservation strategy from the Athens urban air quality story?

Biodiversity in Greece is under severe pressure



Instability in open SES systems propagates effects in interconnected systems and other environmental fields

Is there a simple exegesis of drivers of biodiversity misuse in disturbed SES?



Elements and assumptions of the big compromise...

The elements

- Scientific selection of PAs
- Re-regulation of nature
- Commodification of biodiversity entities

The assumptions

- EKC's are applicable to conservation
- EKC's are unidirectional
- The bridging between neo-classical economic theory and biodiversity conservation techniques allows for optimization of policy making
- The institutionalization of conservation strategy secures its implementation

The essence of the compromise...

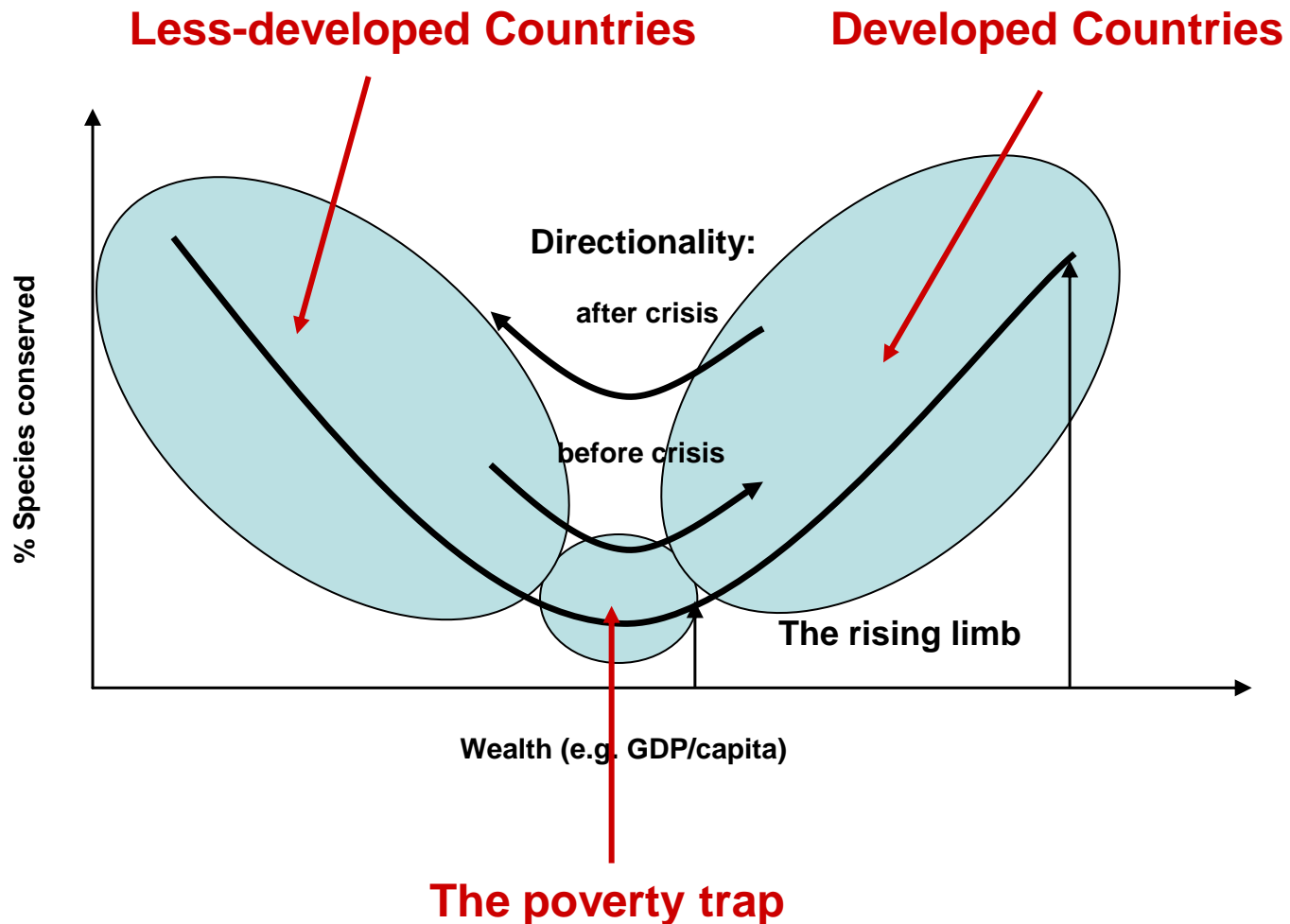
- (a) the shift from 'civilization' to 'development' and currently to 'growth' as the overriding cultural ideal driving international relations during the postcolonial transition;
- (b) the tactical recognition that government support for conservation can be strengthened if arguments are framed in terms consistent with economic development;
- (c) the recognition by scientists that their ability to represent nature in units (species, habitats, etc.) creates the opportunity to integrate ecological theory with neo-classical economics.

This is because dividing nature into parts creates discrete units that can be assigned a monetary value, thereby creating the possibility of treating units of nature as commodities and aligning nature conservation with the free-market delivery of public benefits.

... and the elementary flaws

- The major failures, e.g. 2010 Year of Biodiversity
- The major disputes: the poverty entrapment of biodiversity (or the Third World/Tropics case)
- The scientific rejection on
 - **EKC universality**
 - **EKC directionality**

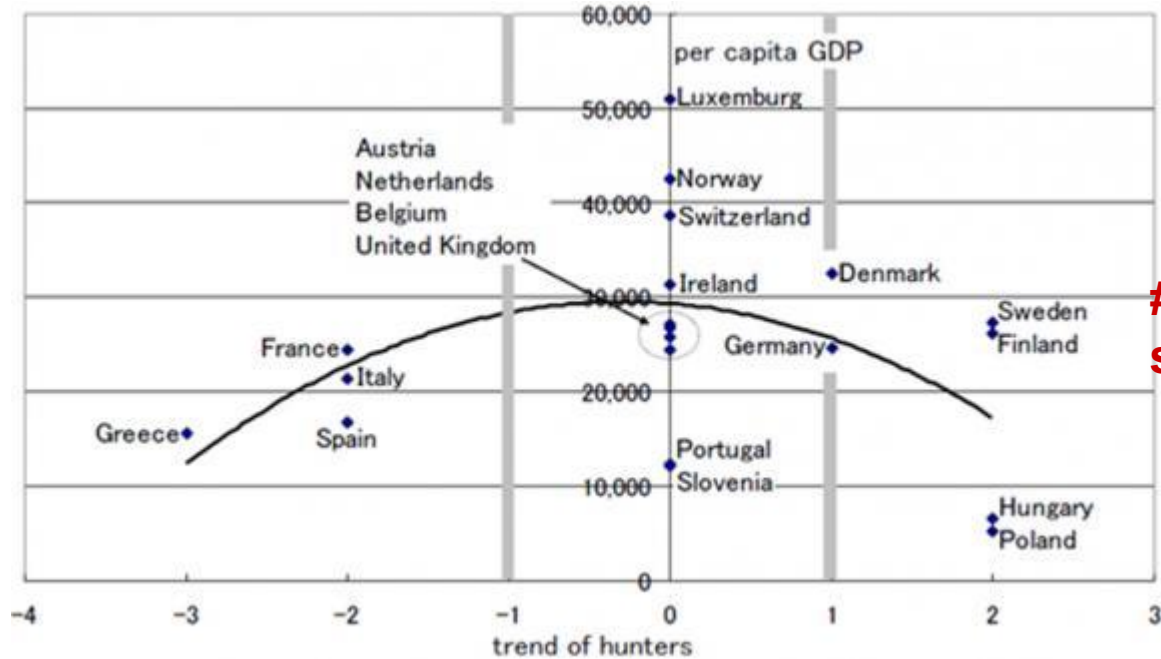
On the conservation EKC and the mainstream assumption



A hypothesis: the 'true' experiment on the validation of mbcs

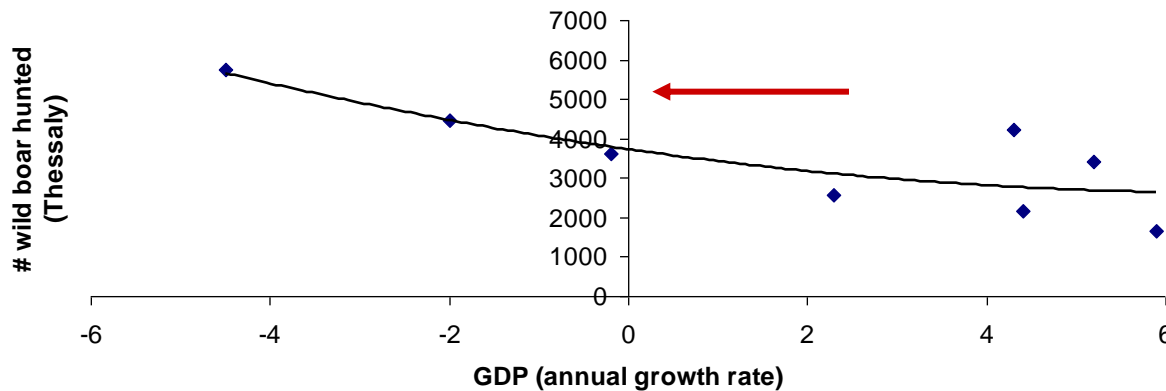
- ...is not the cross country/GDP comparison for conservation EKC's,
- but, the resilience of bc policies in a Western economy in crisis

An example: the case of hunting



The conventional mbc narrative

hunters/hunting pressure stabilizes at high GDP/capita



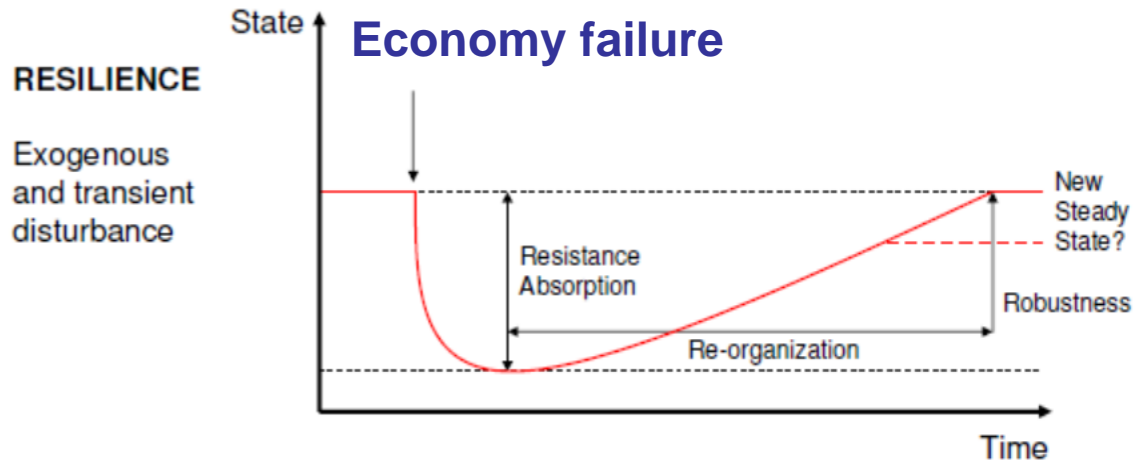
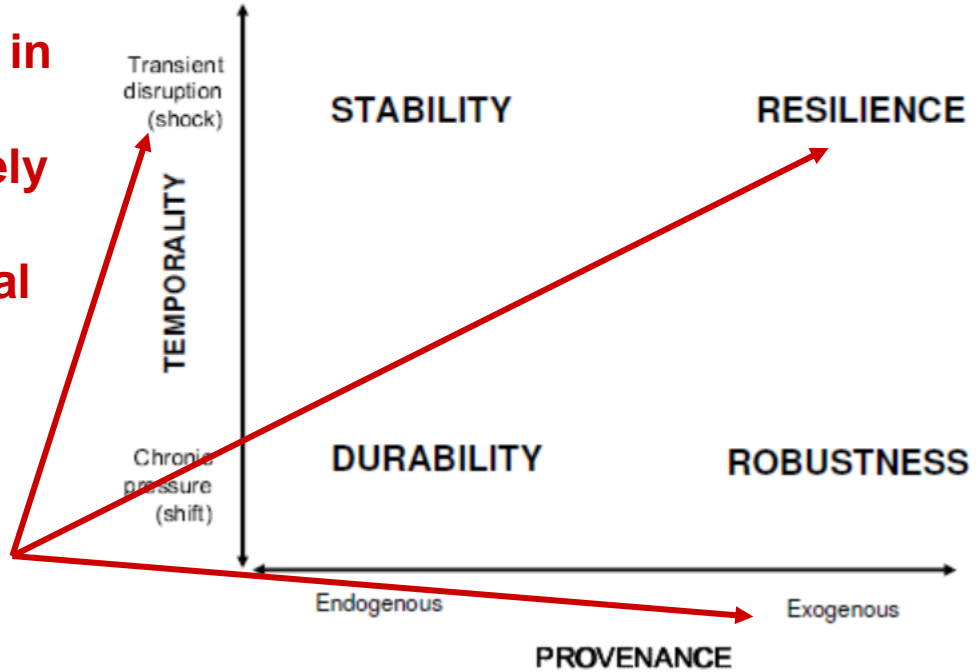
The crisis experiment

Direction of change during crisis

Resilience is an “old” concept in Ecology and Systems Theory, but is currently used extensively and often wrongly in mbc's narrative (especially by political scientists, economists, geographers...).

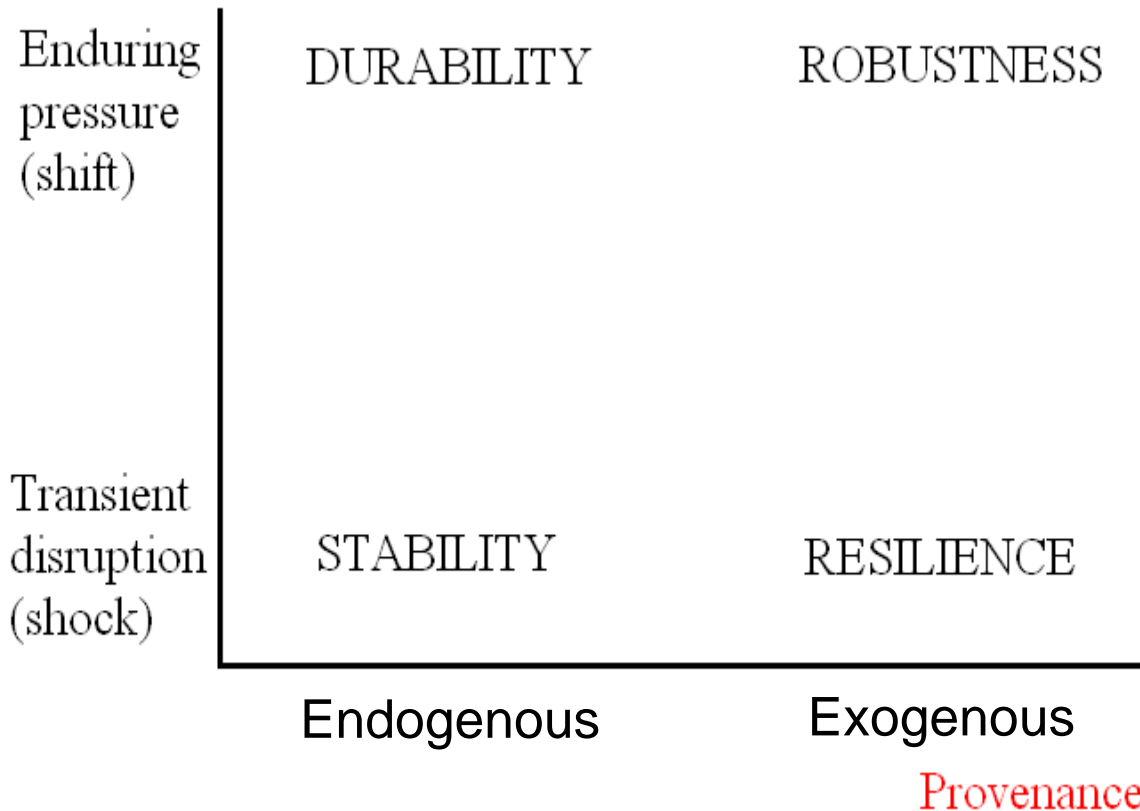
Economic crisis is a transient, disruptive shock, often exogenous

Testing for mbc's resilience means understanding terms and processes



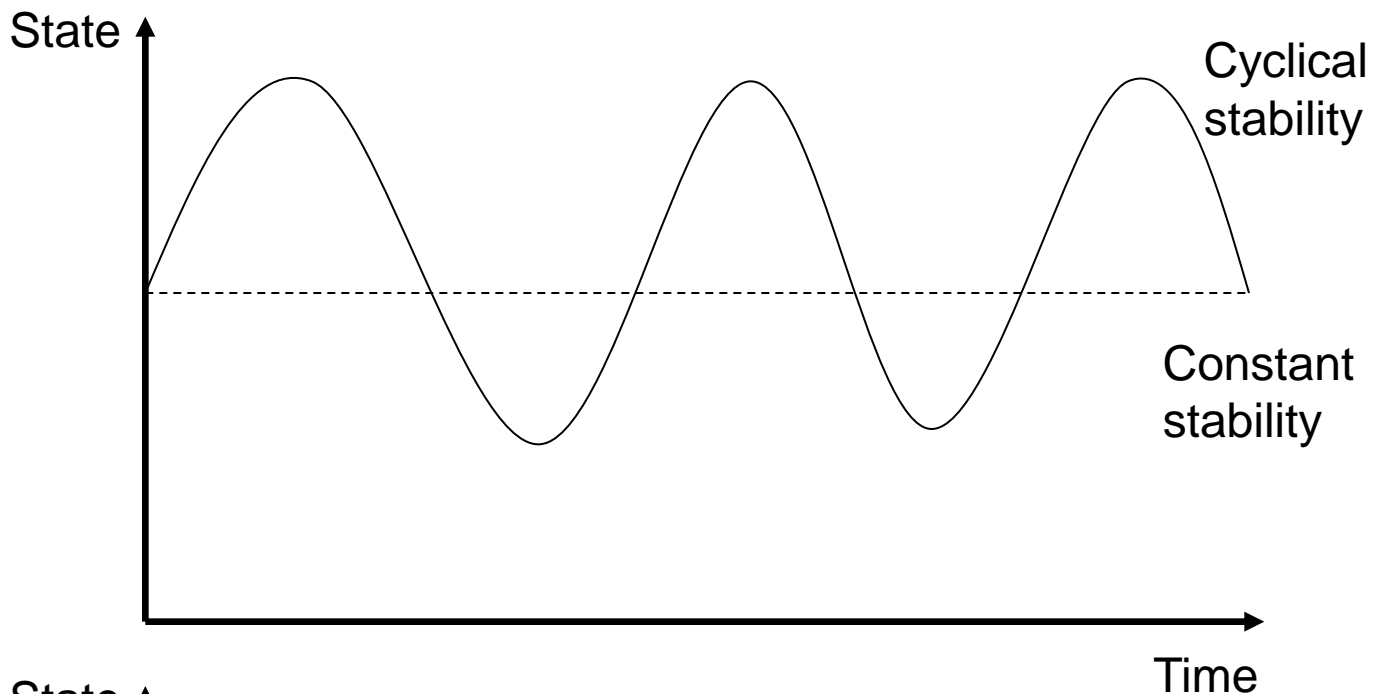
Sustainable properties of dynamic systems

Temporality



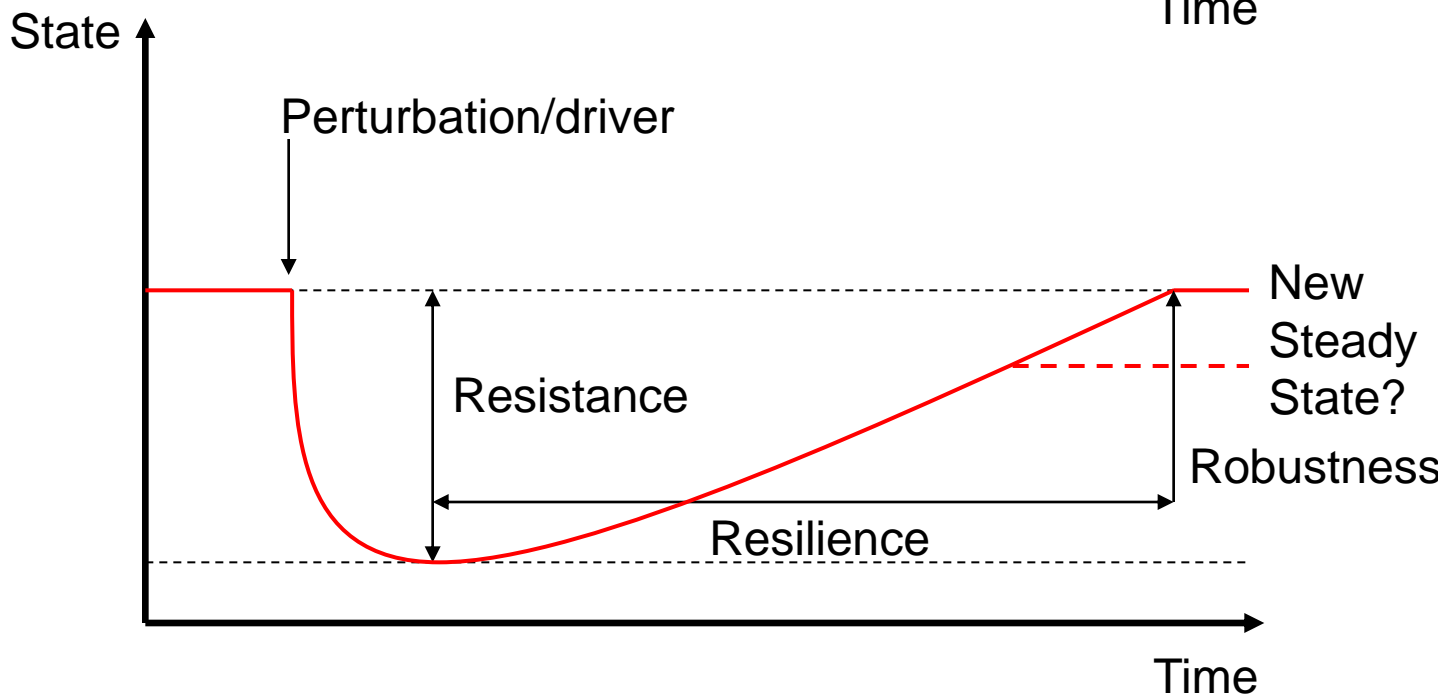
STABILITY (steady state)

Endogenous,
pressures

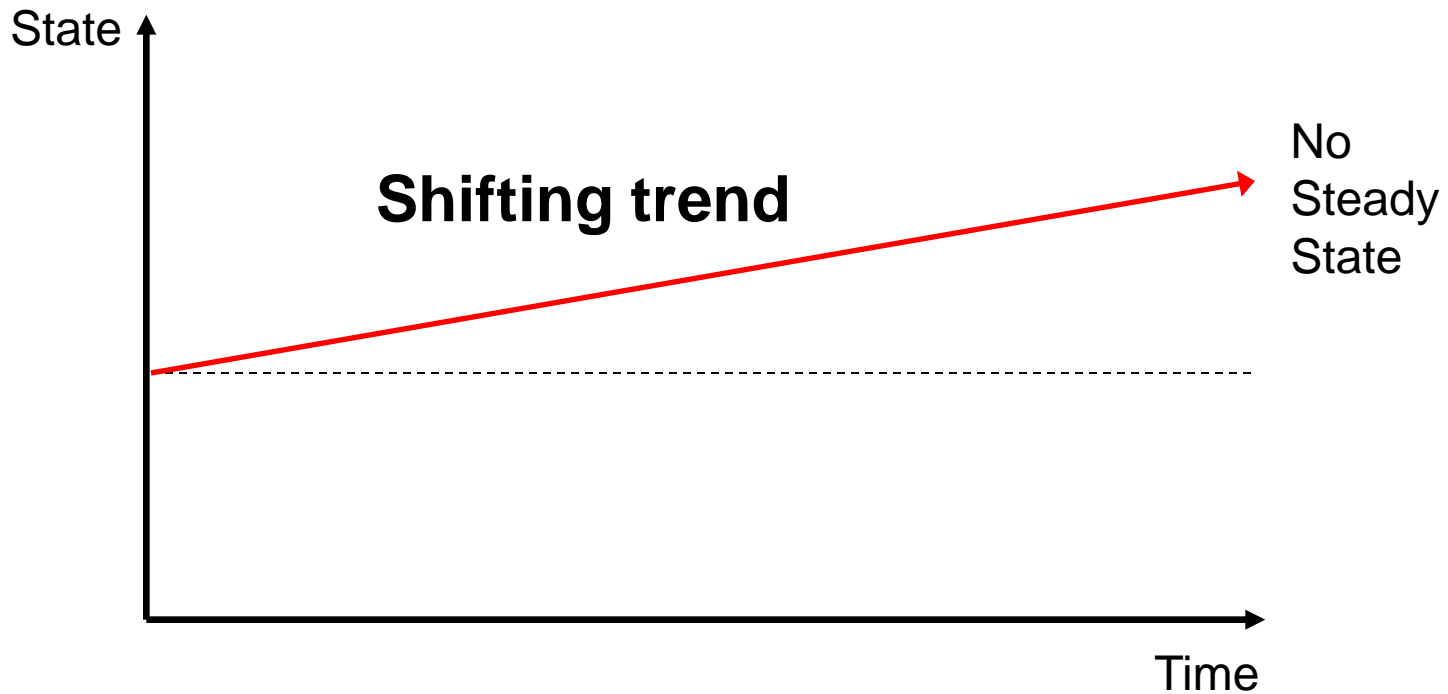


RESILIENCE

Exogenous
perturbations
or drivers



Properties of Durability (endogenous) and Robustness (exogenous) arise from a systems response to a chronic or enduring pressure



Examples: Climate change (exogenous), evolution (endogenous)

A State-Pressure-Response framework for mbc's resilience in Greece

Indicator (<i>indicative</i>)	Data availability (years)	Peak annual value		Trends in change	Sources
		Prior 2008	After 2008		
Economic and social State					
Annual growth rate (%) GDP	['80s-2013]	5,9	-7,1	D	a, b
Aggregate growth rate (%) GDP	[2001-2013]	24,9	-26,2		
Involuntary unemployment (%)	2001-2013	7,2	27,1	I	a, b
Minimum wage (€/month)	2001-2013	817	592	D	a, b
Extreme poverty (% general population)	2001-2013	<2,2	>14	I	c, d
Standard poverty (% general population)	2001-2013	<19,4	>44,3	I	c, d
Cost 1000 lt of house heating gasoil (€)	2005-2013	737,5	1336,5	I	a

State indicators: Examples of indicators on the nature and intensity of the exogenous disruptive shock

A State-Pressure-Response framework for mbc's resilience (2)

Pressure upon biodiversity (<i>proxies</i>)					
(i) # hunters (<i>legal</i>)	['80s]-['10s]	>230000	<185000	D	e
(ii) # <i>Illegal</i> hunters (<i>estimate</i>)		N/A	270000 (±3%)	I	
(iii) Intensity of poaching (<i>confirmed cases</i>)	2001-2011	2100	2101	I	f
(iv) Intensity of illegal logging (<i>confirmed cases in 65 Local Forestry Offices</i>)	2001-2012	546	1964	I	g.
(v) Intensity of illegal logging (<i>confirmed quantities, tons</i>)	-2011				g
Coniferous species		<122	>480		
Broadleaved species		<1446	>8051		
(vi) # penalties for illegal fishing (<i>days of ban for fishermen and boats</i>)	2001-2011	20810	25460	I	h

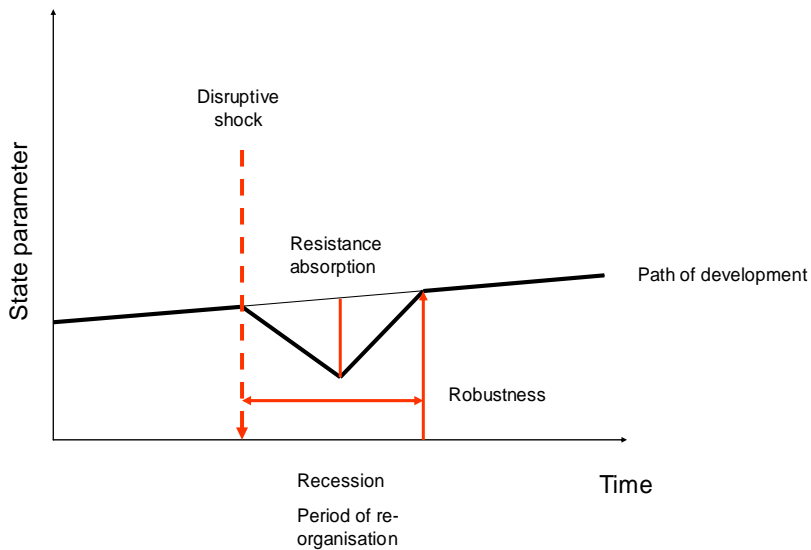
Pressure indicators: Examples of indicators on the nature and intensity of the Endogenous pressure upon biodiversity

A State-Pressure-Response framework for mbc's resilience (3)

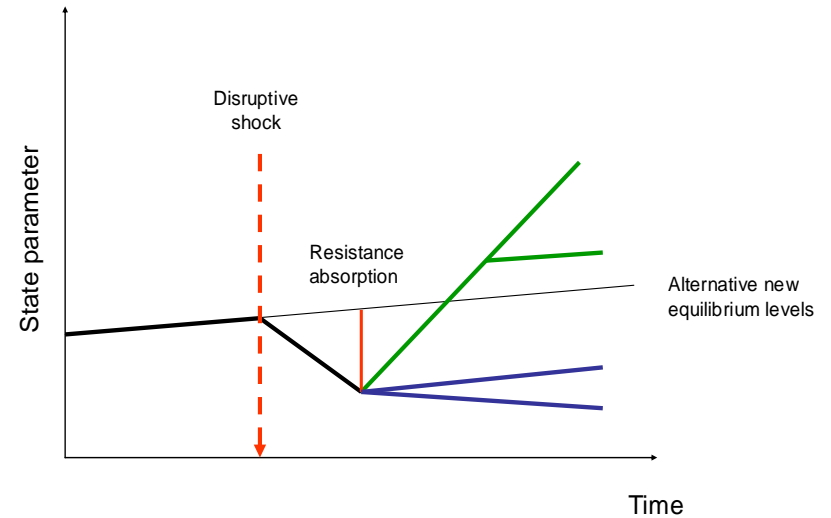
Response					
<u>PADDD</u> cases	>2010	?	+	sporadic	National Laws
PA Implementation efficiency (# PA Agencies)	1998-2011	29	14	F	National Laws
Public spending for the "Environment" (€/year)	2001-2011	30,485,000	478,927	D	g
Public spending for Forest Management/ Protection (€/year)	2001-2011	16,824,176	2,179,123	D	g
Land allocation for <u>HF</u>	?-2011	?	+	D	National Laws
Emergence of nature-scepticism	1998-2011	-	+	I	TV reports, Newspapers

Response indicators: Examples of indicators on the nature of Environmental Administration decisions

Two visions of resilience



Return to a previous state



**Multiple attractors
Alternative new equilibria**

**Re-definition of mbc's: goals,
targets, assumptions and
processes**

The official concept of biodiversity: the heart of the problem

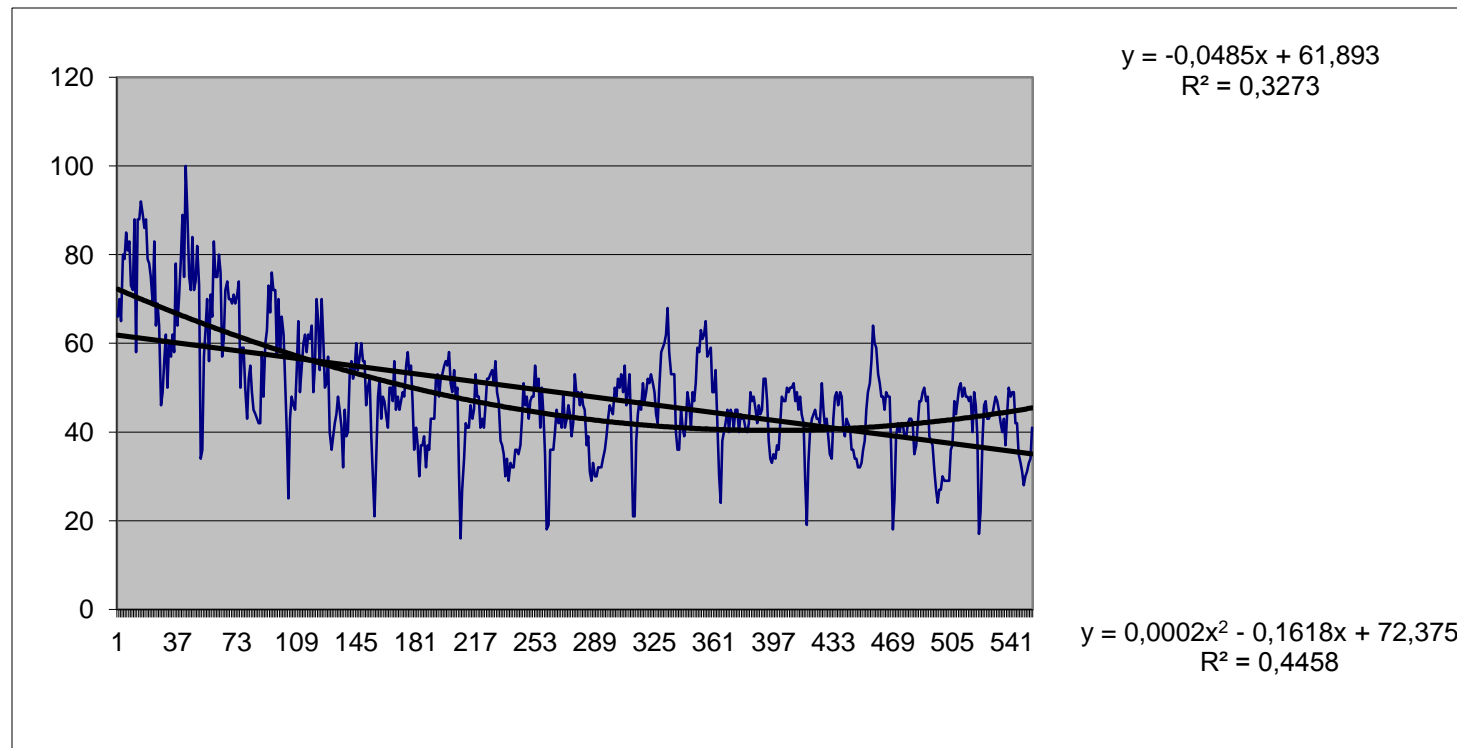
Biodiversity is

- **a scientific neologism**
- **a political construction**
- **a disruptive concept**
- **a boundary object**
- **a successful invader of public sphere/discourse**

Biodiversity is losing speed in the public interest

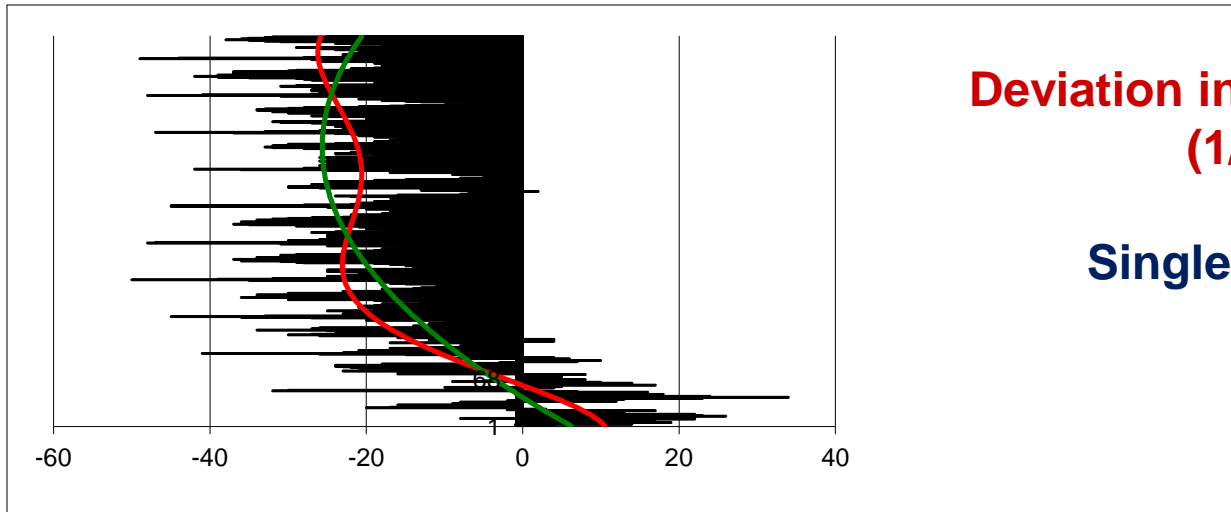
Opinion polls or individual research results are snapshots

Big data on individual internet queries, e.g. *Google Trends*



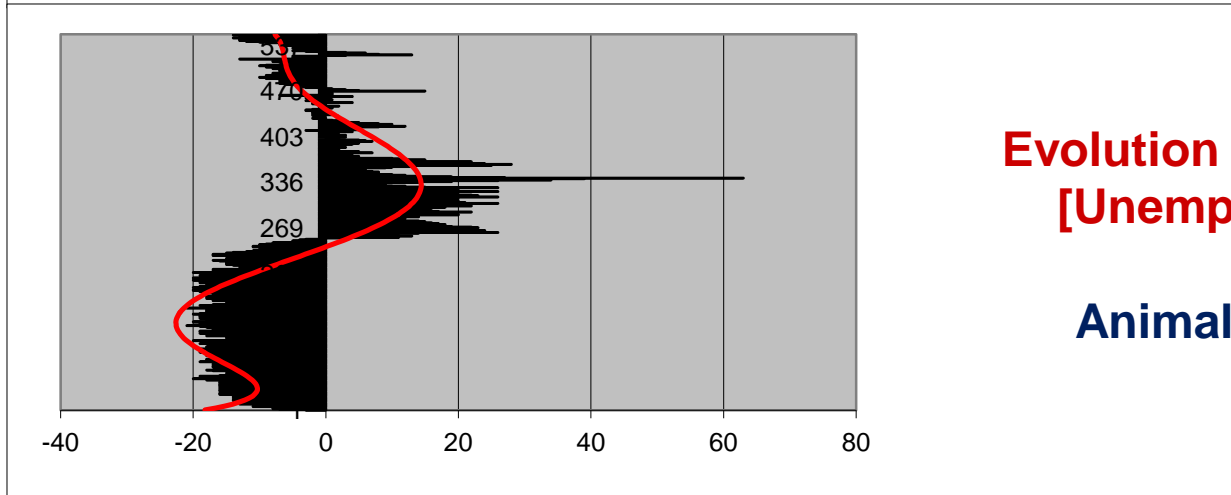
Data on worldwide hits (1/2004-8/2014) for biodiversity: a proxy of interest

Is there an explanation for this trend?



**Deviation in interest from Average
(1/2004-8/2014)**

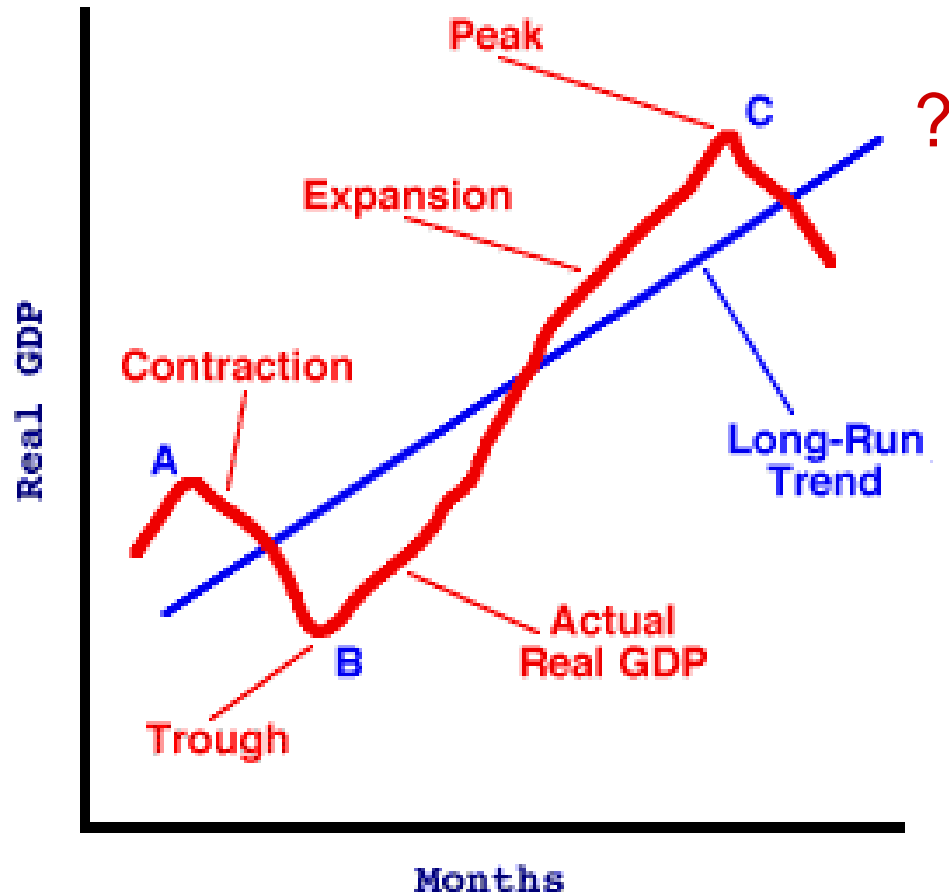
Single event or Cycles?



**Evolution of the comparative metric
[Unemployment - Biodiversity]**

Animal spirits and economy?

Hypothesis: interest in biodiversity is not implicit, but fluctuates in relation to economy



Two potential outcomes:

- 1. The slope is positive, then in the long run, BAU**
- 2. The slope is negative, then a new mbcs is urgently needed**