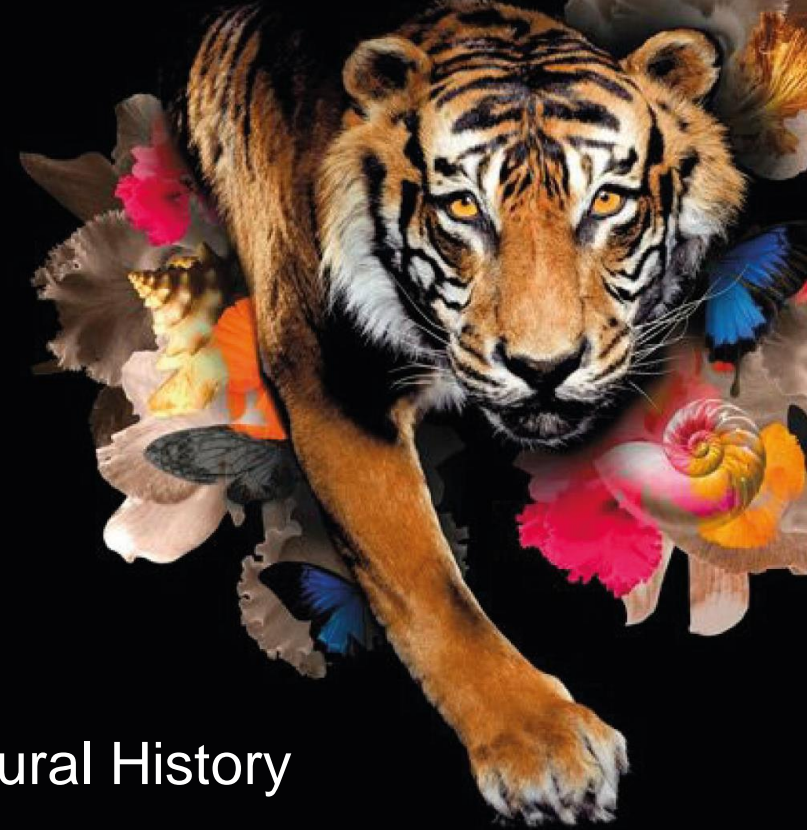


Conference

**Biodiversity and
Re/insurance**

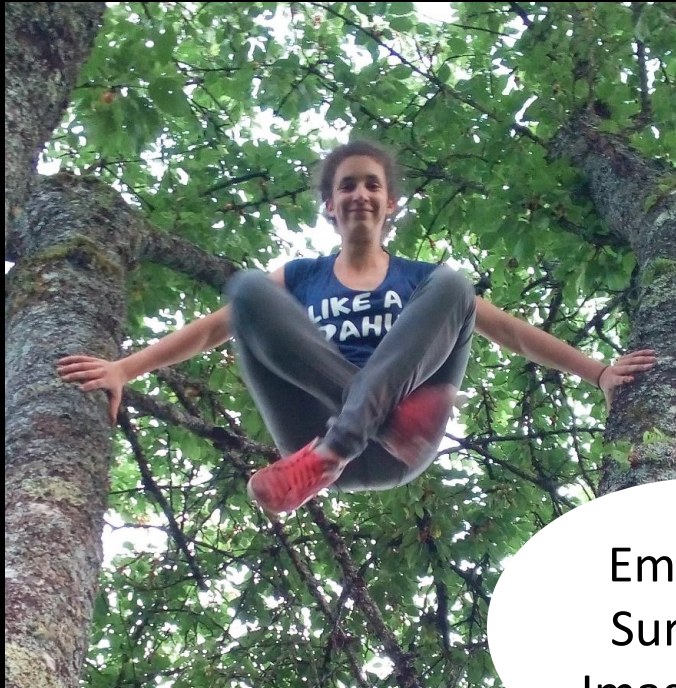


Anne-Caroline PREVOT

CNRS senior scientist, National Museum of Natural History

Nature and transformative changes?

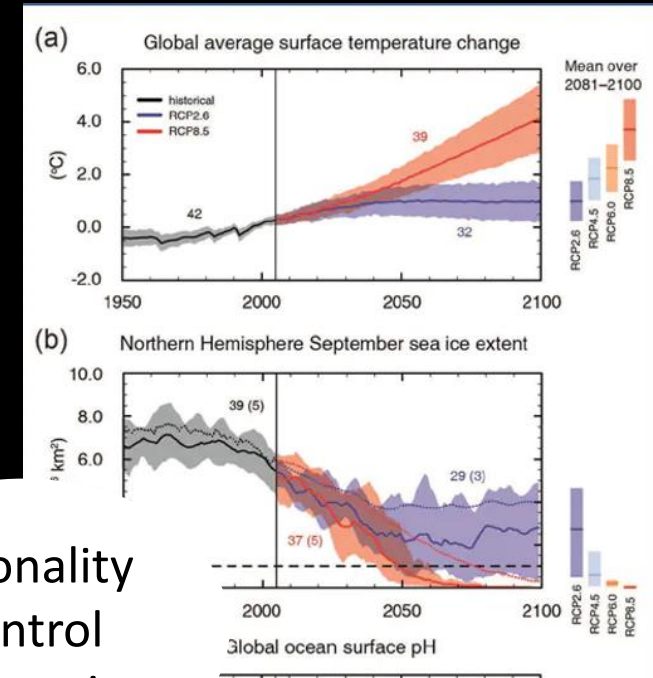
OUR PRIVATE LIVES



Emotions
Surprises
Imagination



OUR PUBLIC LIVES



Rationality
Control
Prospective

DOMINANT MODERN WORLD VISION

Things and events belong to different categories
Events are predictable and explained by rationality
Time in linear and future is predictable

NATURE

Diversity of living beings
in permanent inter-
relations with each other.

Highly dynamic
assemblages in space and
time.

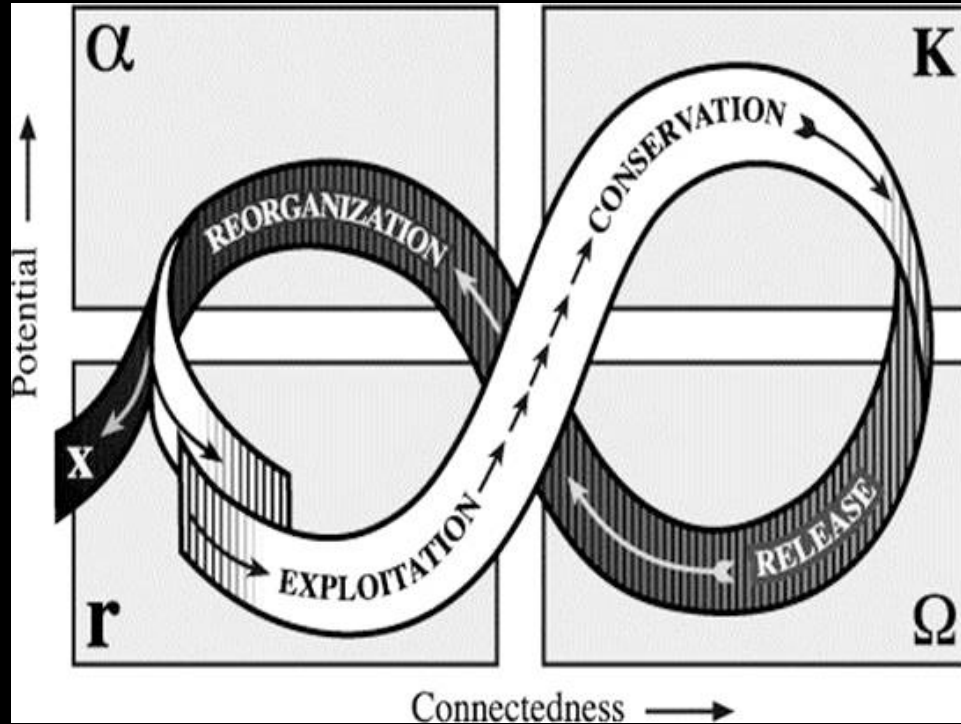
No need of any control or
help from humans

Not friend nor enemy of
humans

Unpredictable fates



SOCIAL-ECOLOGICAL SYSTEMS ADAPTIVE CYCLES



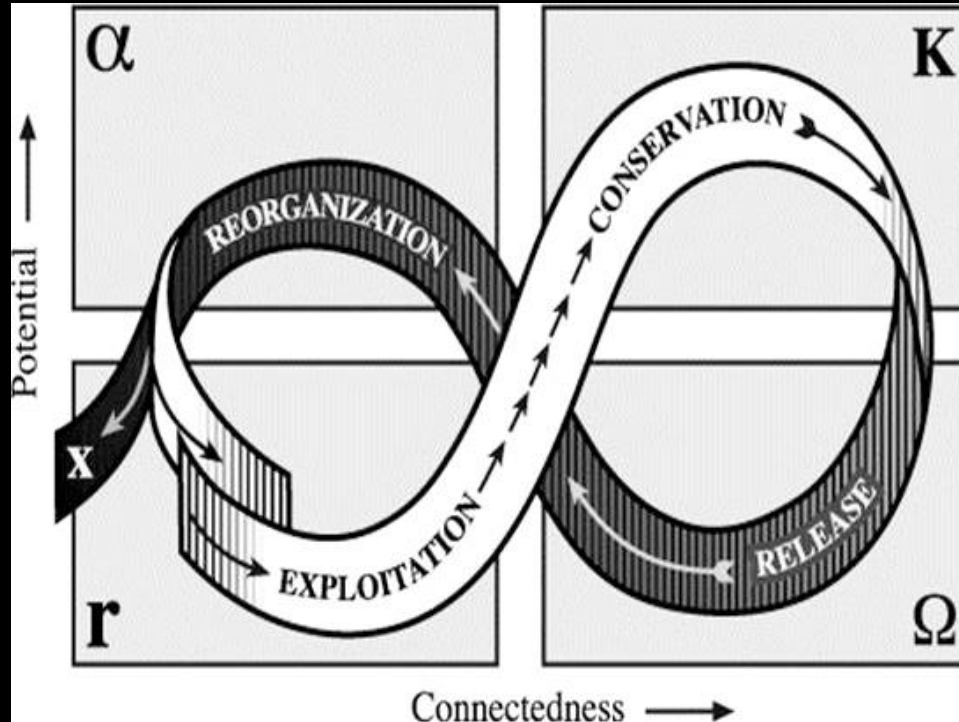
Long periods of apparent stability

=> interconnections between components
accumulate and enrich

Short periods of reorganizations

after a perturbation of the system.

SOCIAL-ECOLOGICAL SYSTEMS ADAPTIVE CYCLES



Wealth

Organization, richness, diversity of its components.
⇒ Limits of what is possible, the number of alternatives for the future

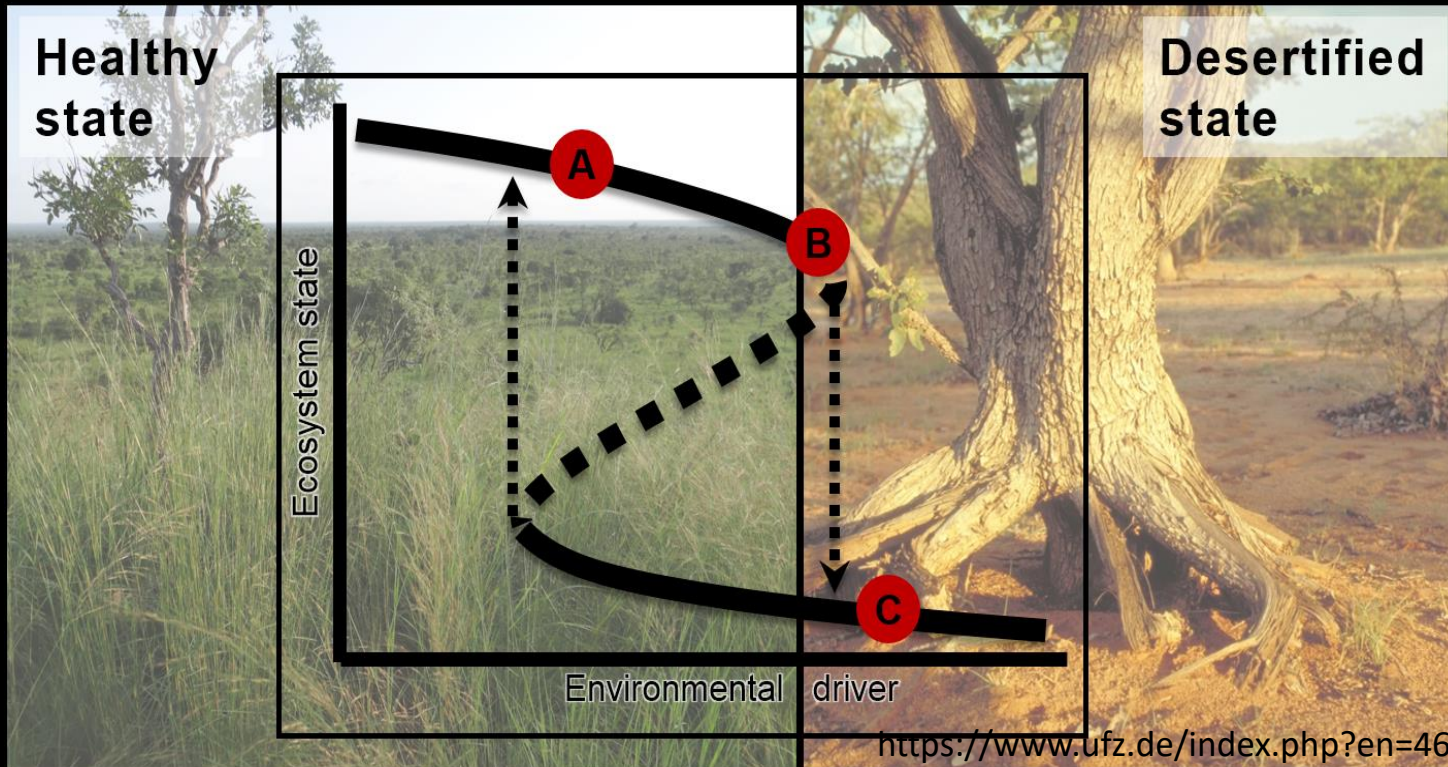
Internal controllability

Degree of connectedness between internal processes and interrelations.
⇒ Flexibility or rigidity of internal controls and feedback loops
⇒ Sensitivity to perturbation.

Adaptive capacity

Vulnerability to unexpected or unpredictable shocks

SOCIAL-ECOLOGICAL SYSTEMS REGIME SHIFTS



Few examples of documented regime shifts:

Freshwater eutrophication
Fisheries collapse

Seagrass transitions
Forest to savannah

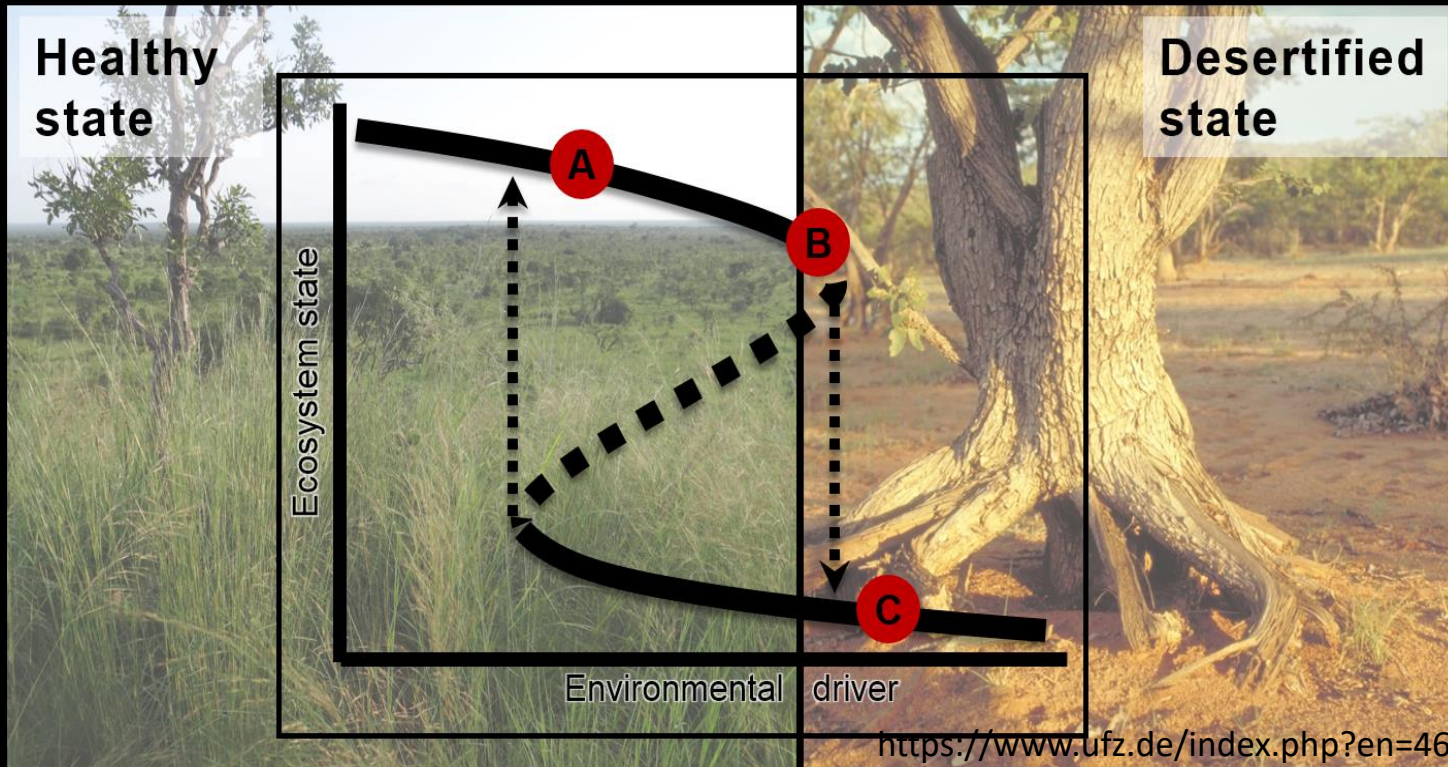
River channel position

Thermohaline circulation
West Antarctic ice sheet
Arctic sea-ice loss

Common pool resource
Sprawling vs. compact city

Biggs R et al. (2018) The regime shifts database: a framework for analyzing regime shifts in social-ecological systems. *Ecology and Society* 23(3):9

SOCIAL-ECOLOGICAL SYSTEMS REGIME SHIFTS



Regime shifts impact the quality of life :

- Aesthetic
- Recreation
- Knowledge and education
- Spiritual and religious

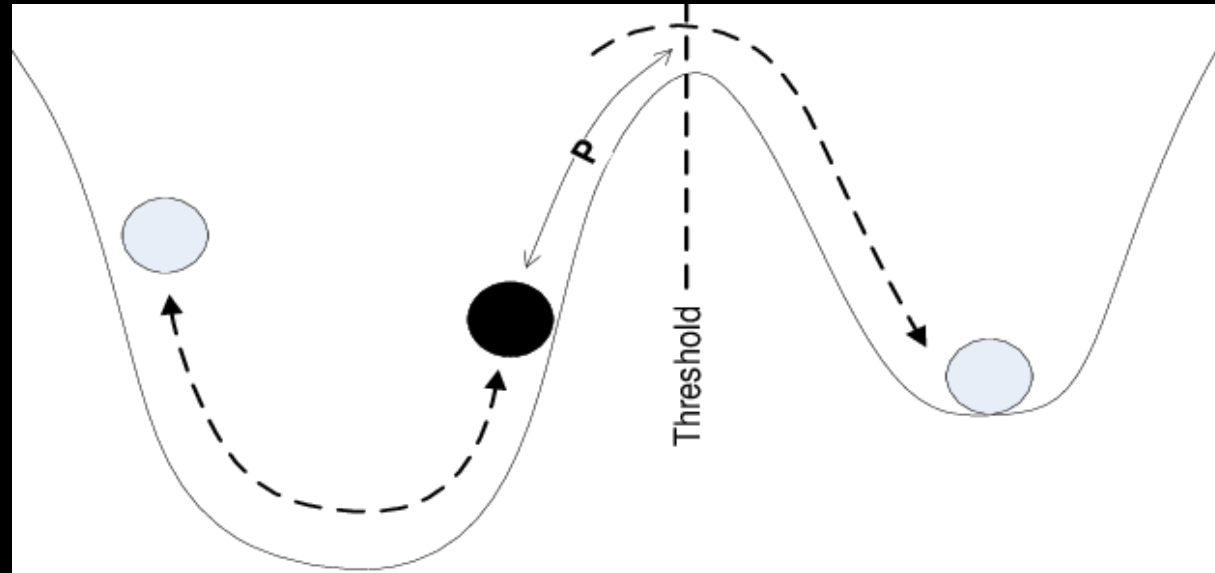
- Livelihoods and economic activity
- Food and nutrition
- Security of housing & infrastructure

- Health
- Social conflict
- Cultural identity

Biggs R et al. (2018) The regime shifts database: a framework for analyzing regime shifts in social-ecological systems. *Ecology and Society* 23(3):9

SOCIAL-ECOLOGICAL SYSTEMS RESILIENCE

It depends on...



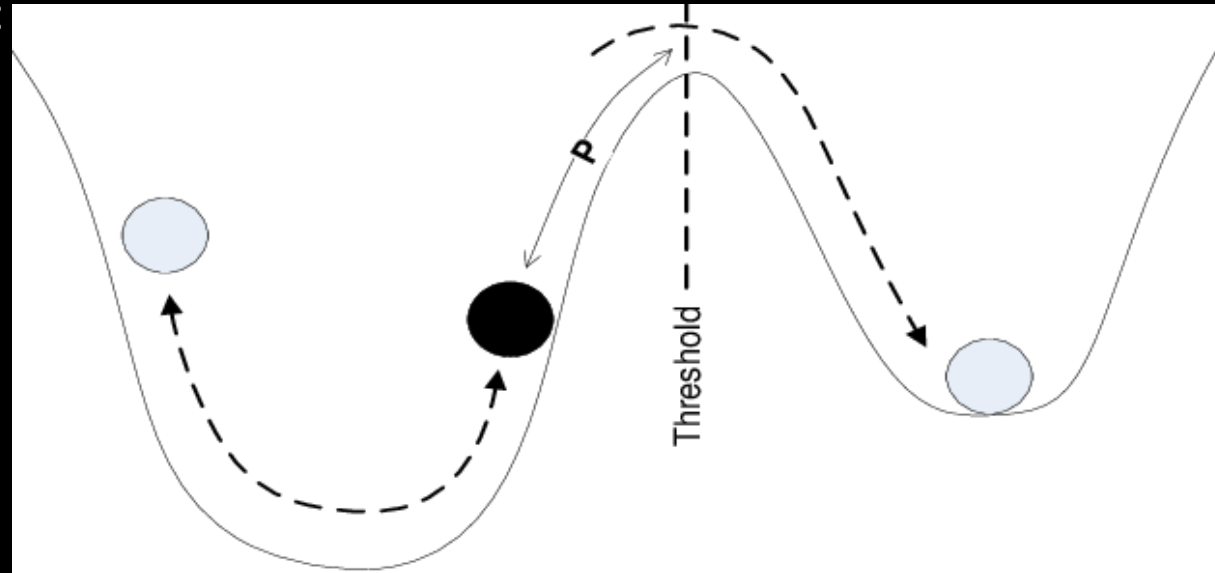
- The magnitude of shock that the system can absorb and remain within a given state
- The degree to which a system is capable of self-reorganization
- The degree to which a system can build capacity for learning and adaptation

Folke C et al (2002) Resilience and sustainable development: Building adaptive capacity in a world of transformations. *Ambio* 31:437–440

SOCIAL-ECOLOGICAL SYSTEMS ARE RESILIENT if...

1) ... they can absorb larger shocks without changing in fundamental ways, by :

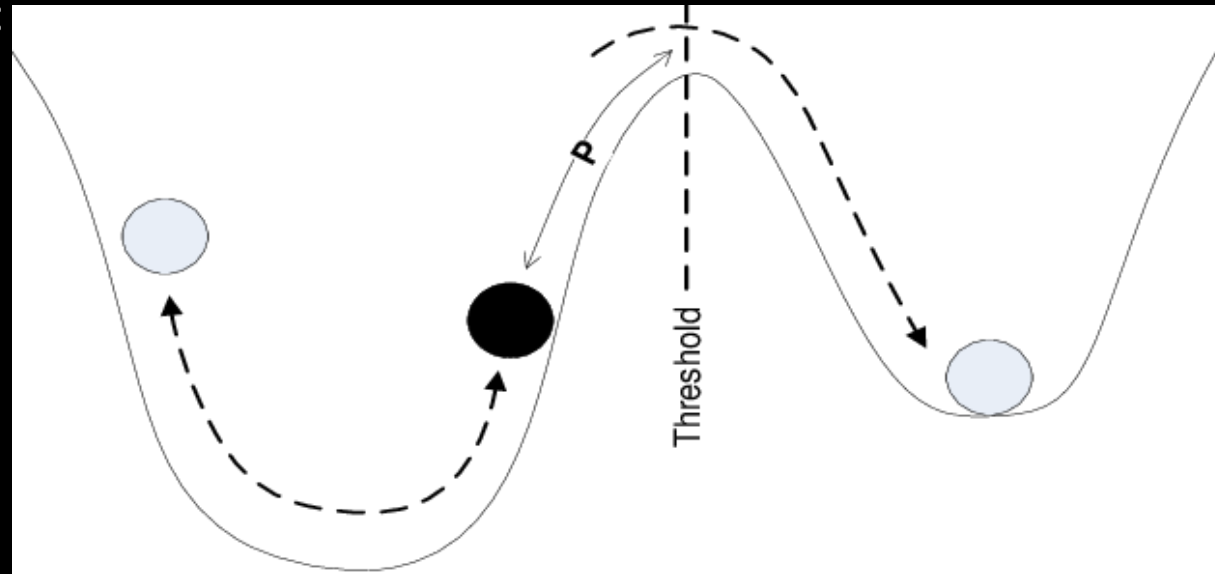
- maintaining diversity and redundancy
- managing connectivity
- managing slow variables and feedbacks



SOCIAL-ECOLOGICAL SYSTEMS ARE RESILIENT if...

1) ... they can absorb larger shocks without changing in fundamental ways, by :

- maintaining diversity and redundancy
- managing connectivity
- managing slow variables and feedbacks



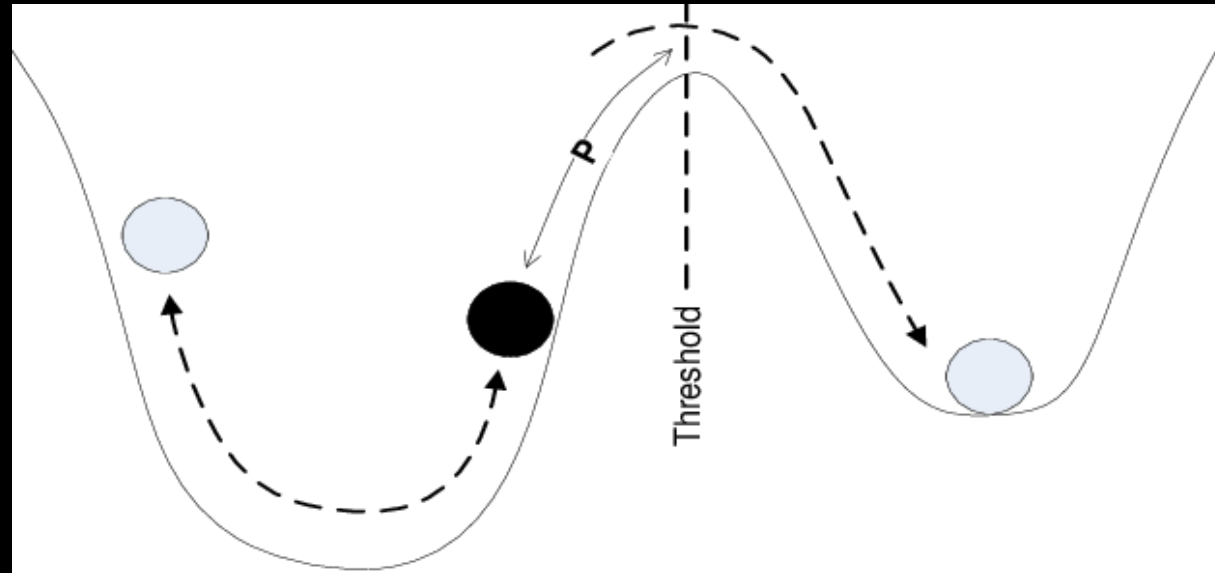
2) And they contain the components needed for renewal and reorganization, by:

- fostering complex adaptive systems thinking
- encouraging learning
- broadening participation
- promoting polycentric governance systems

SUSTAINABILITY and TRANSFORMATIVE CHANGES ?

Do we want to remain
definitely in our
current valleys?

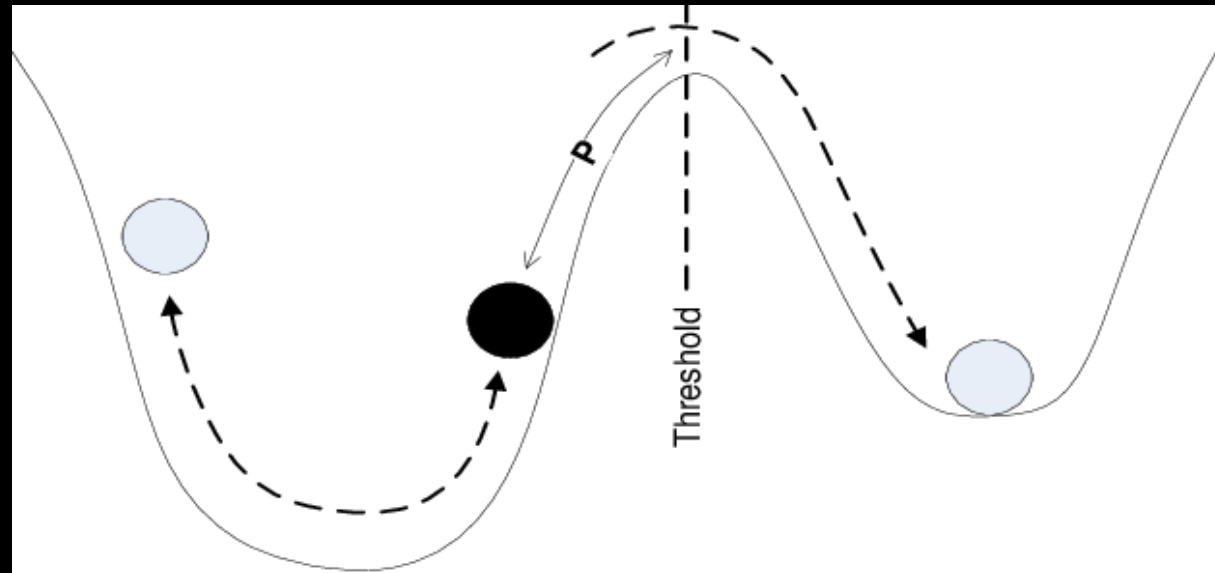
*INCOMPATIBLE WITH
SUSTAINABILITY*



“Goals for conserving and sustainably using nature and achieving sustainability cannot be met by current trajectories, and goals for 2030 and beyond may only be achieved through transformative changes across economic, social, political and technological factors” (IPBES 2019)

SUSTAINABILITY and TRANSFORMATIVE CHANGES ?

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INCOMPATIBLE WITH SUSTAINABILITY

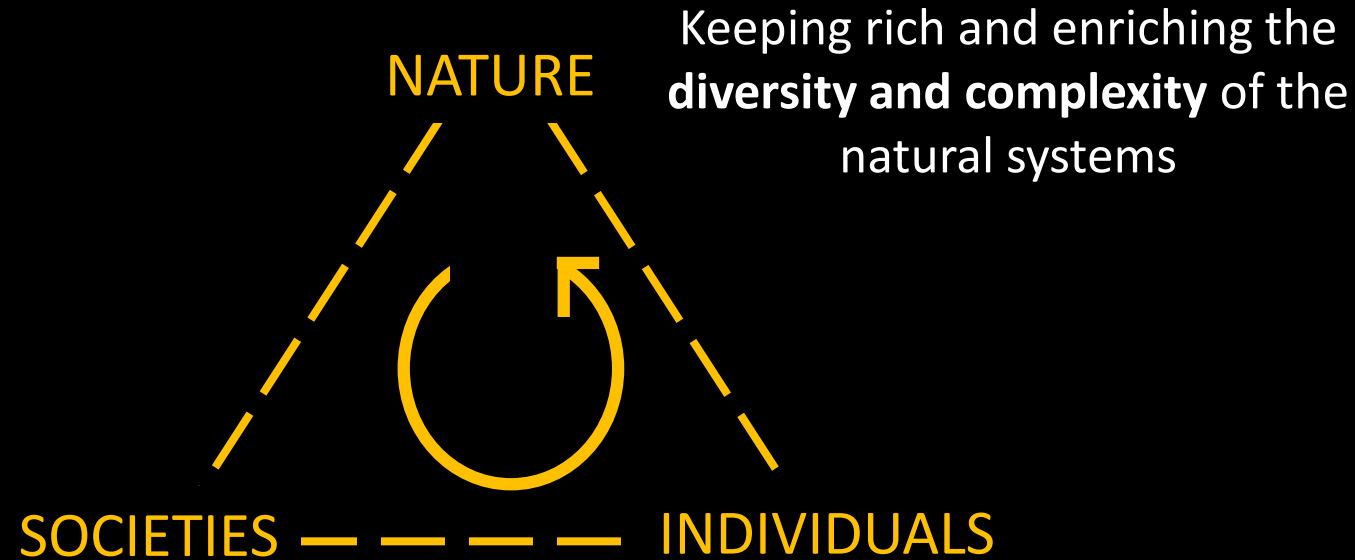


“Goals for conserving and sustainably using nature and achieving sustainability cannot be met by current trajectories, and goals for 2030 and beyond may only be achieved through transformative changes across economic, social, political and technological factors” (IPBES 2019)



We have to prepare ourselves collectively to change valleys without too much trouble

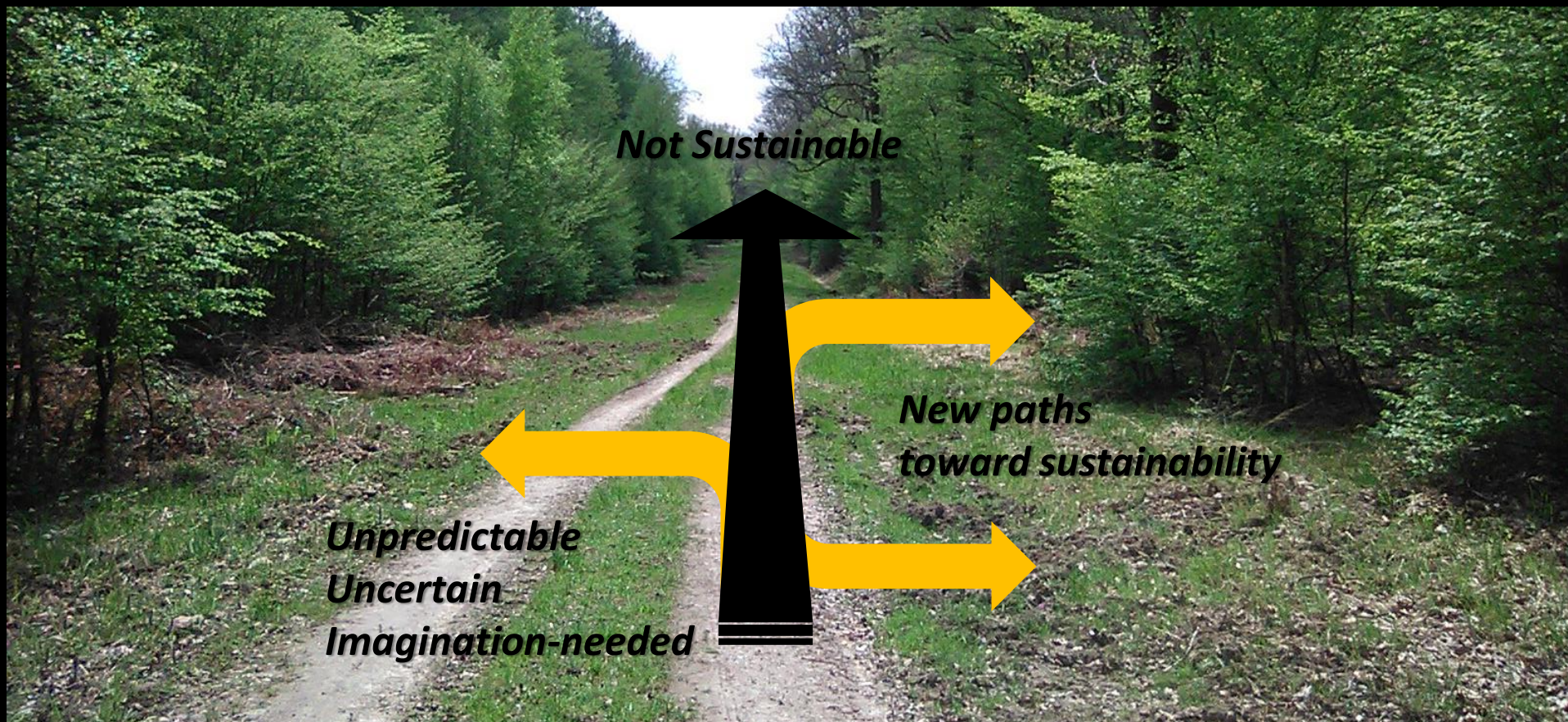
TRANSFORMATIVE CHANGES FOR SUSTAINABILITY



Encouraging **transformative governance**

- ⇒ Integrating
- ⇒ Informed
- ⇒ Adaptive
- ⇒ Inclusive

Encouraging **complex experiences of nature**
=> Embodied, emotional, social and cognitive learning of nature



Not Sustainable

*New paths
toward sustainability*

*Unpredictable
Uncertain
Imagination-needed*

Thank you for your attention

anne-caroline.prevot@mnhn.fr