

futureearth
research for global sustainability

Our objective

To provide the knowledge required for societies in the world to face risks posed by global environmental change and to seize opportunities in a transition to global sustainability

Two key aims

- Scientific integration
- Co-production of knowledge:
solutions-oriented

Grand challenges for science

- Planetary stewardship
- Social equity
- Human well-being and security

A new sense of urgency and pressure to contribute to real-world problem solving

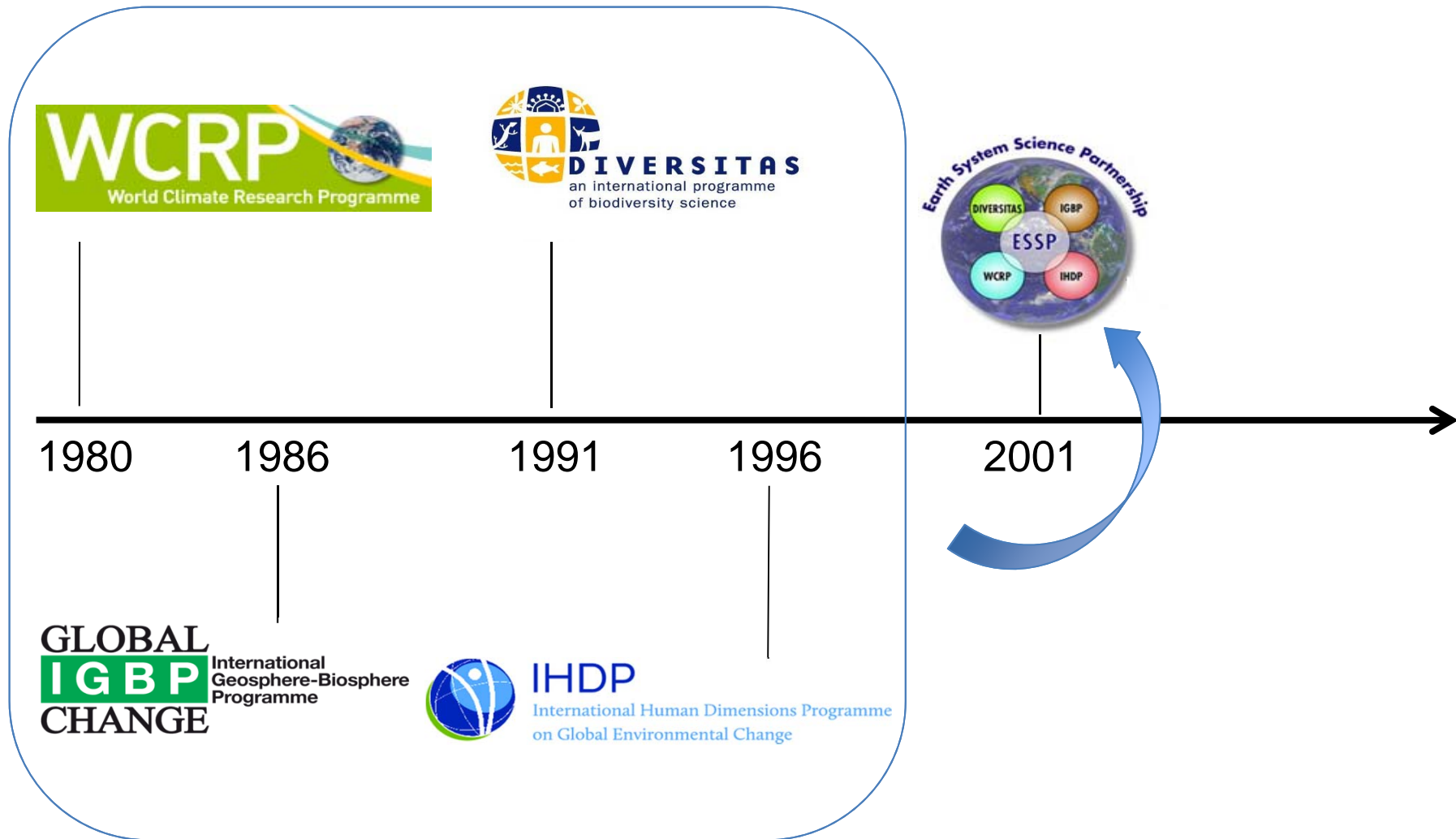


Complex challenges

- Feeding 9 billion people within sustainable planetary boundaries
- Valuing and protecting nature's services and biodiversity
- Transitioning to low carbon societies
- Adapting to a warmer and more urban world
- Coping with disasters
-



Origins of Future Earth



Examples of GEC projects 1

- **ecoSERVICES**: links between biodiversity, ecosystem functioning and services



Available online at www.sciencedirect.com

SciVerse ScienceDirect



Impacts of land change on biodiversity: making the link to ecosystem services

Harini Nagendra^{1,2}, Belinda Reyers³ and Sandra Lavorel⁴

We lack sufficient understanding of the processes by which biodiversity alterations induced by land cover change impact ecosystem functioning. An understanding of the mechanistic role of biodiversity is required to provide a functional perspective on ecosystem service delivery. To bridge this gap, investigating complementarity and heterogeneity in functional traits within species groups or across trophic levels is particularly relevant. Such an understanding will then facilitate spatial mapping of areas of co-occurrence of multiple ecosystem services, as well as of critical trade-offs between monetized, cultural and other supporting ecosystem services that need to be considered as hard constraints to ecosystem management. In doing so, the nature and underpinnings of tradeoffs between bundles of ecosystem services accruing to different regions and groups of people, impacting equity and wellbeing, will be uncovered to support improved policy and land planning.

over recent centuries, and particularly the past 50 years, have driven fundamental changes in the earth's land cover, increasing the extent of human dominated land cover categories, for example, cropland [3*] and urban [4], as well as impacting land cover through processes of land cover modification such as forest degradation [3*], land use intensification [5], fragmentation [6], vegetation recovery and regrowth [7], that have received less attention compared to land cover change. These changes and modifications in land cover/land use constitute the most dominant drivers of biodiversity loss globally [3*], altering the composition, distribution, and abundance and functioning of biological diversity. These changes ultimately affect the structure and function of ecosystems, and alter their capacity to provide sustained ES for the benefit of humankind [8*].

Examples of GEC projects 2

- **PAGES: Past Global Changes**



The screenshot shows the PAGES website in a Firefox browser window. The address bar displays "www.pages-igbp.org". The website header features the PAGES logo and navigation links: "contact", "subscribe", "contribute", and social media icons for Facebook, Twitter, and RSS. A search bar is located on the right side of the header.

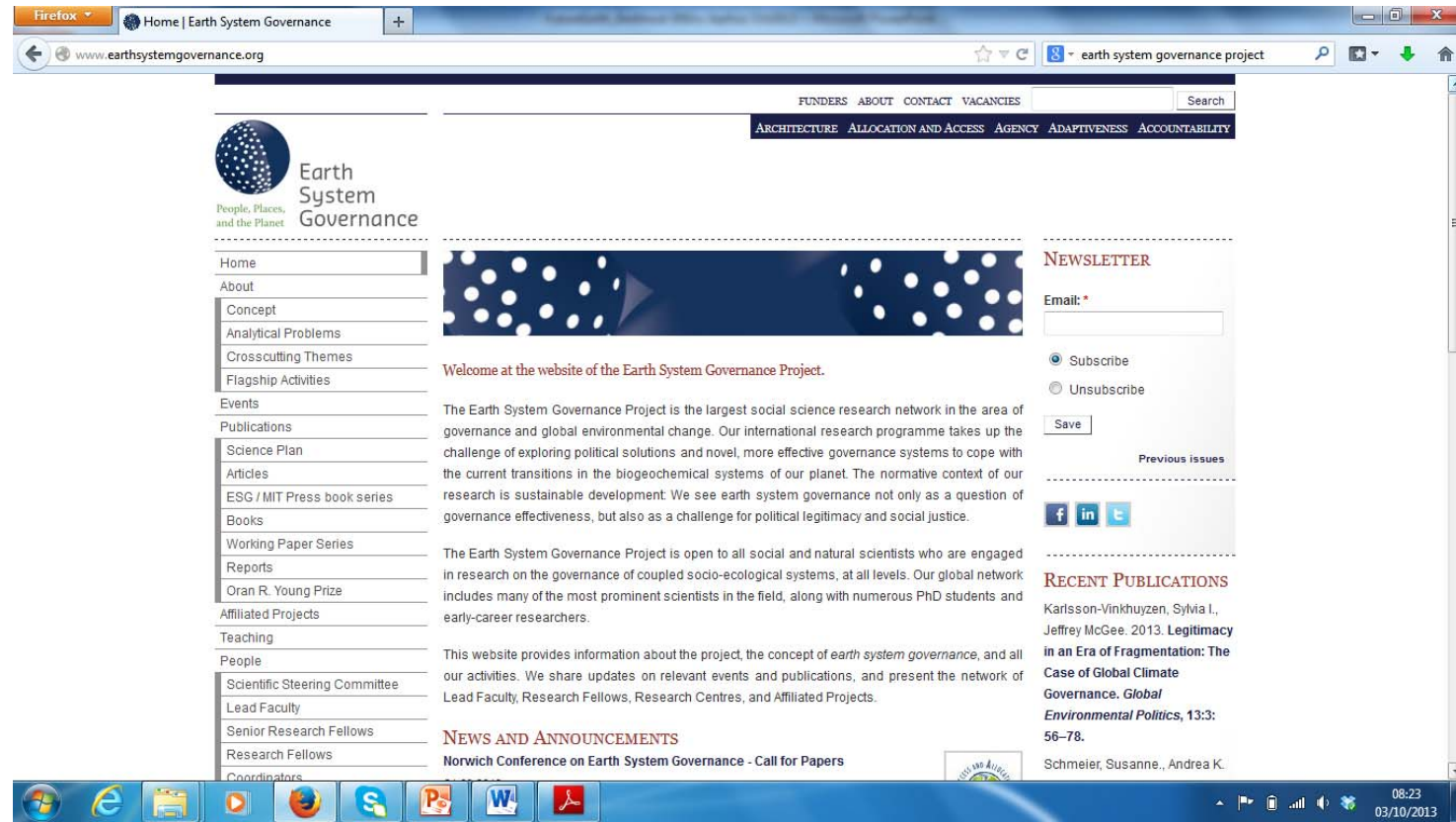
The main content area includes a large image of Earth from space and a historical landscape. Below the image is the heading "Welcome to PAGES" and a paragraph of text: "The PAGES (Past Global Changes) project is an international effort to coordinate and promote past global change research. The primary objective is to improve our understanding of past changes in the Earth System in order to improve projections of future climate and environment, and inform strategies for sustainability. ... more". Below this is a sub-heading "IMAGES-2 Science Plan out" with the date "05 Sep 2013" and a link to "The International".

On the right side, there is a "Latest News" section with the following text: "IMAGES-2 Science Plan out", "Latest PAGES news", "Our visiting guest scientists", "Eos article: 2nd YSM report", and "OSM plenaries now online". Below this is a "Latest PAGES news" section with the text "PAGES news, vol 21, no. 2" and a link to "El Niño-Southern Oscillation". A small image of the PAGES news journal cover is shown, with editors listed: "Editors: P. Braconnot, C. Brierley, S. P. Harrison, L. von Gunten, T. Kiefer". A link to "> PAGES news archive" is also present.

The bottom of the screenshot shows the Windows taskbar with various application icons and the system tray displaying the time "08:21" and date "03/10/2013".

Examples of GEC projects 3

- **Earth System Governance: Governance for sustainability: navigating the Anthropocene**



The screenshot shows the website www.earthsystemgovernance.org in a Firefox browser window. The page features a navigation menu with links for FUNDERS, ABOUT, CONTACT, and VACANCIES, along with a search bar. The main content area includes a welcome message, a description of the project as the largest social science research network in the area of governance and global environmental change, and information about the project's openness to all social and natural scientists. A sidebar on the left lists various sections like Home, About, Publications, and People. A newsletter sign-up form and a list of recent publications are also visible on the right side of the page.

Earth System Governance
People, Places, and the Planet

Welcome at the website of the Earth System Governance Project.

The Earth System Governance Project is the largest social science research network in the area of governance and global environmental change. Our international research programme takes up the challenge of exploring political solutions and novel, more effective governance systems to cope with the current transitions in the biogeochemical systems of our planet. The normative context of our research is sustainable development: We see earth system governance not only as a question of governance effectiveness, but also as a challenge for political legitimacy and social justice.

The Earth System Governance Project is open to all social and natural scientists who are engaged in research on the governance of coupled socio-ecological systems, at all levels. Our global network includes many of the most prominent scientists in the field, along with numerous PhD students and early-career researchers.

This website provides information about the project, the concept of *earth system governance*, and all our activities. We share updates on relevant events and publications, and present the network of Lead Faculty, Research Fellows, Research Centres, and Affiliated Projects.

NEWS AND ANNOUNCEMENTS
Norwich Conference on Earth System Governance - Call for Papers

NEWSLETTER
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RECENT PUBLICATIONS
Karlsson-Vinkhuyzen, Sylvia I., Jeffrey McGee. 2013. *Legitimacy in an Era of Fragmentation: The Case of Global Climate Governance*. *Global Environmental Politics*, 13(3): 56-78.
Schmeier, Susanne., Andrea K.

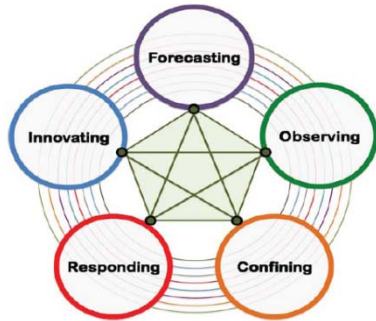
Examples of GEC projects 4

- CLIVAR: Variability and predictability of the ocean-atmosphere system



Developing Future Earth

ICSU – ISSC
Visioning



Science and Technology
Alliance for Global
Sustainability

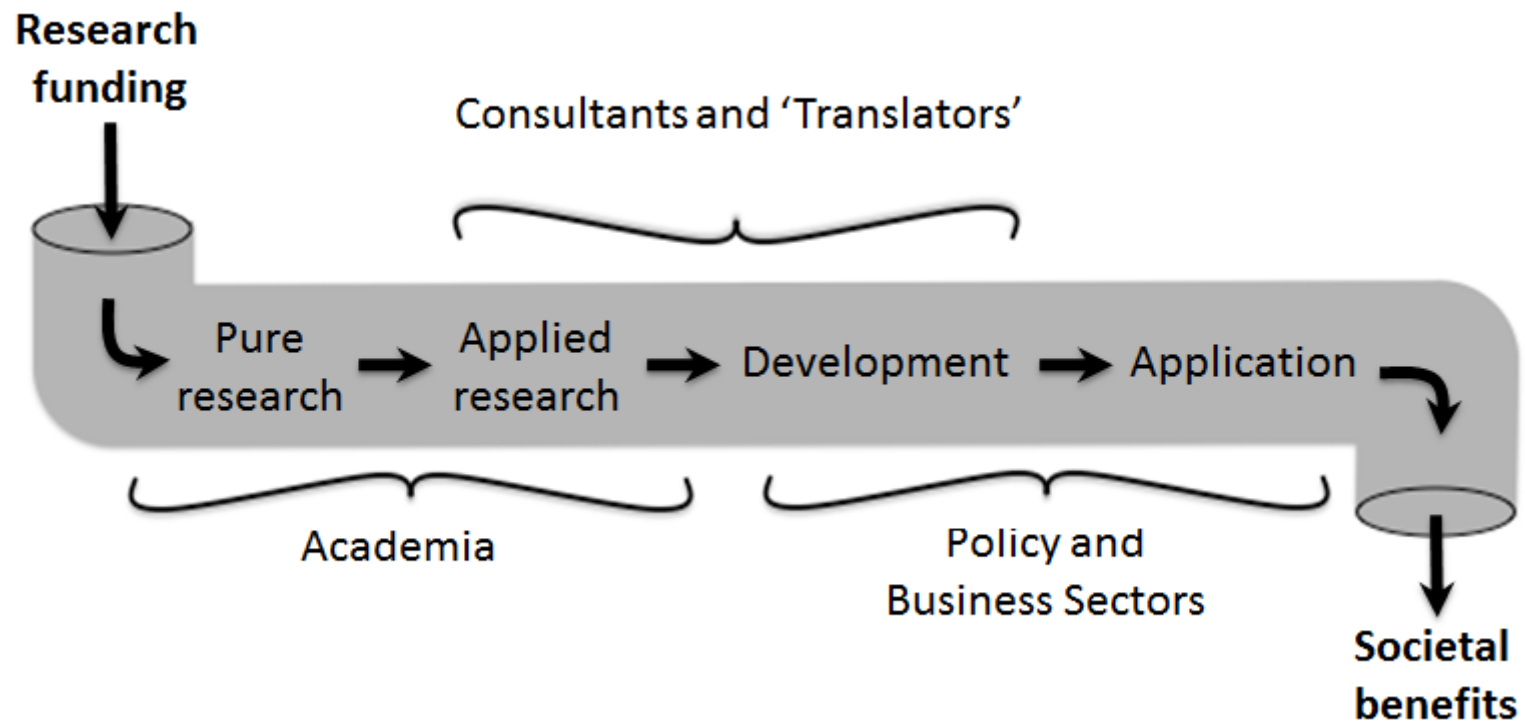
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BELMONT
FORUM

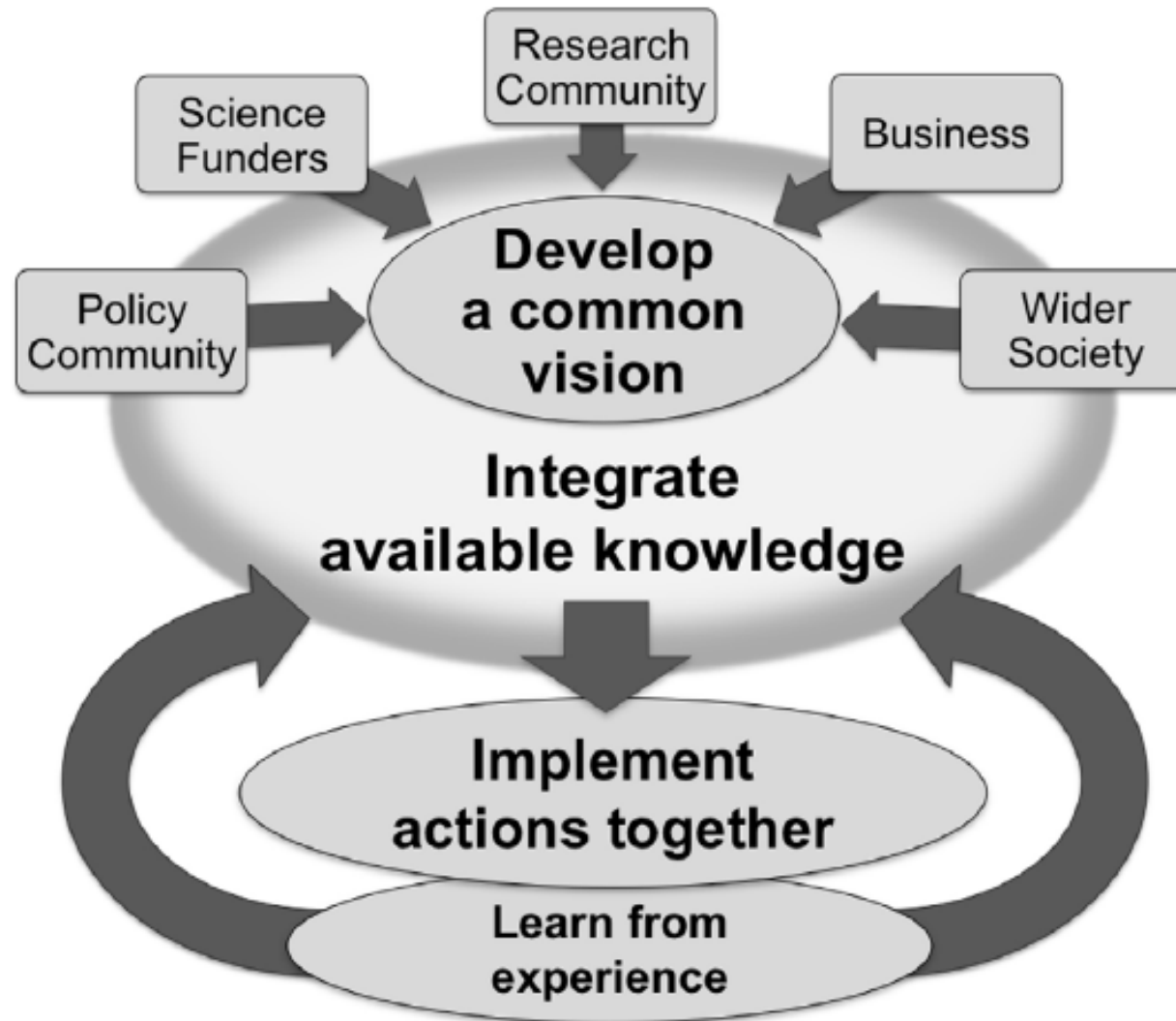
futureearth

What is Future Earth?

- A **global platform** for international research collaboration on global environmental change and sustainable development
- Provides **integrated research** on major global change challenges and transformations to sustainability
- Strengthens partnerships between researchers, funders and users of research through **co-design** of research
- Is **solutions-oriented**, aiming to generate knowledge that contributed to new more sustainable ways of doing things

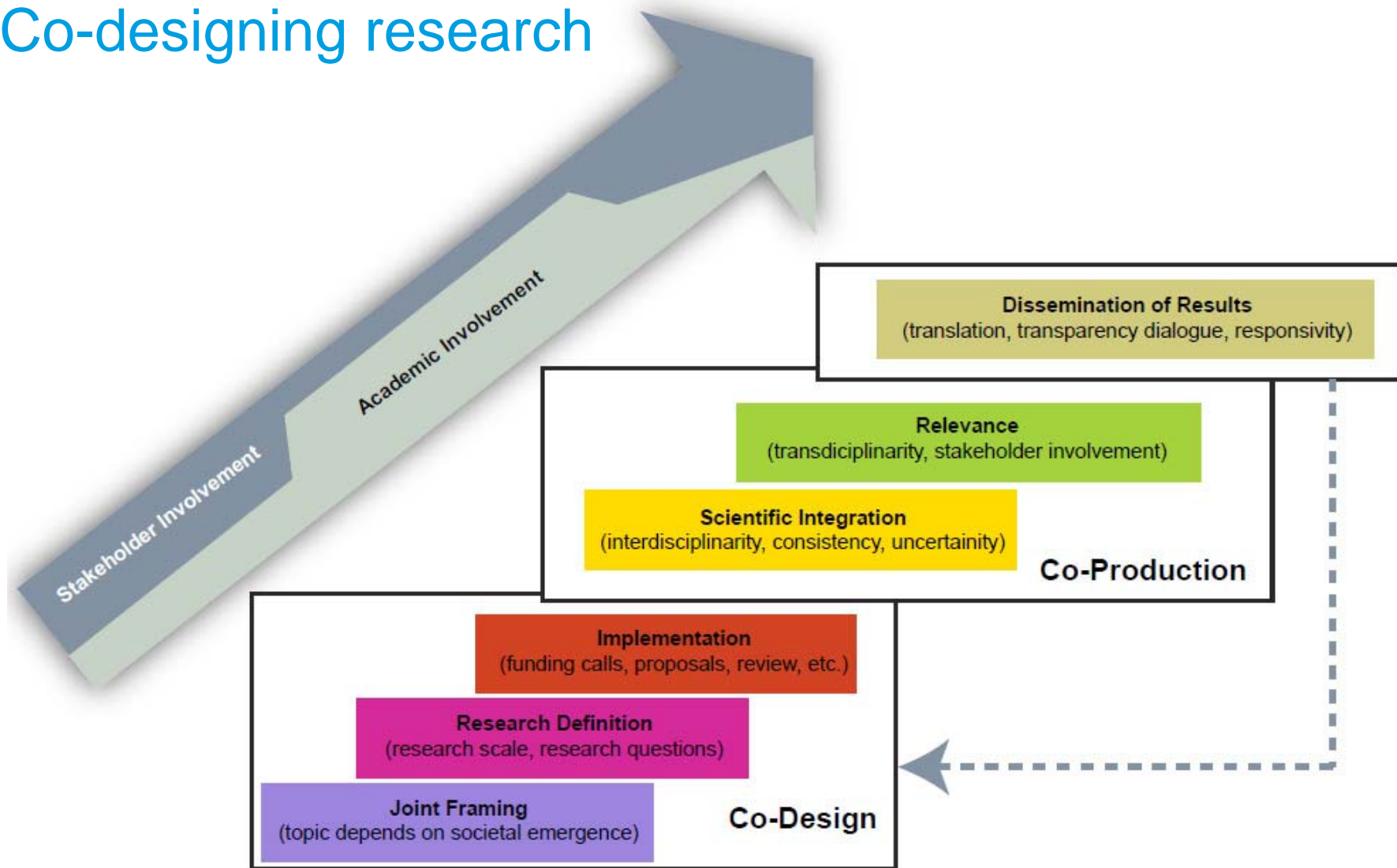


The 'linear model'



Co-Production of Knowledge

Co-designing research

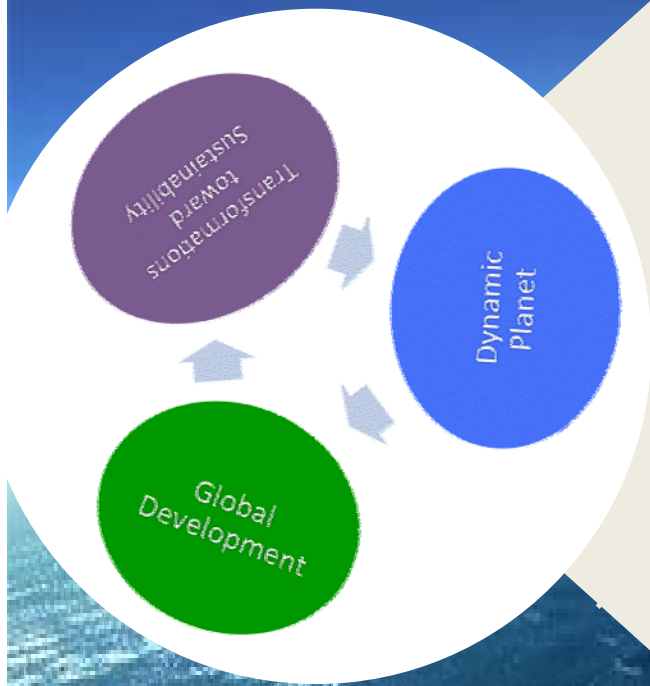


Source: Mauser et al., *COSUST*, 2013

Research Themes

1. Dynamic Planet
2. Global Development
3. Transformations towards Sustainability

Dynamic Planet



projecting environment

Approaches and Models

drivers

societal system

observing

- **States and Trends**

explaining

thresholds

understanding

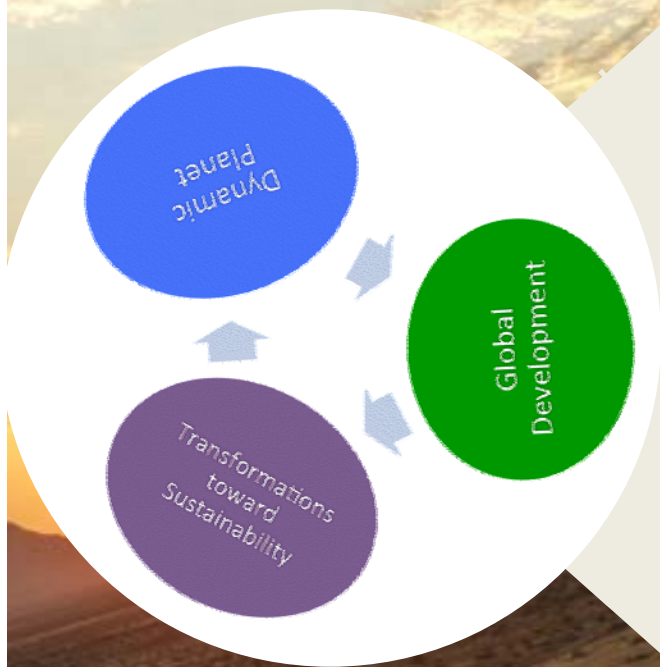
Critical Zones

coasts

tropical forests

polar regions

Global Development



clean air
Stewardship of resources

materials
mining
biodiversity

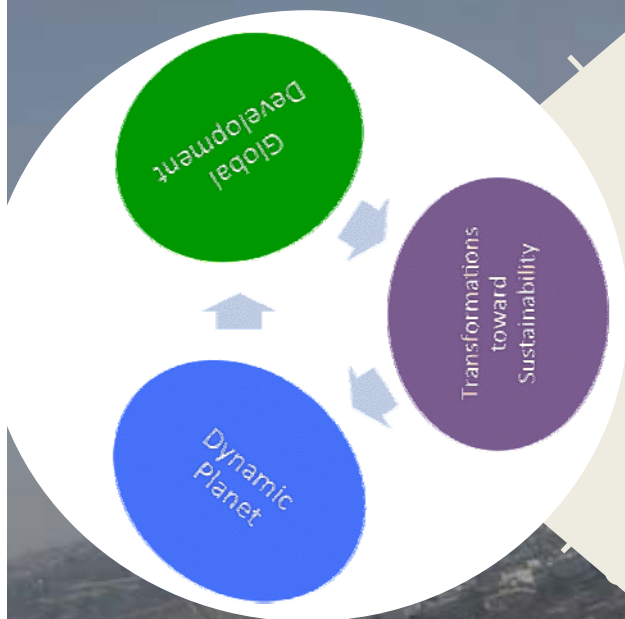
• **Ecosystem services**

Trade-offs
climate change
fisheries

Equitable access

food security
water availability
healthy environment

Transformations towards Sustainability



Transformation process

decision making
economy
mega-cities
development options

- **Innovation and ideas**

trade-offs
emerging technology
assessment of policies

Local and regional governance

incentives
international law
regional enforcement

Current status

Recent

- Scientific Committee established
- Interim Secretariat
 - Director appointed and secretariat hosted by ICSU in Paris, France

Short-term priorities

- Further develop Future Earth governance
- Bring existing GEC projects into Future Earth
- Launch new Future Earth projects and initiatives
- Consolidate Future Earth communications and brand
- Attract new resources into Future Earth science and action

Future Earth Science Committee (2013)



Science and Technology Alliance for Global Sustainability



Funding



Get involved

1. Sign up to the Future Earth Newsletter
2. Bring your scientific communities to Future Earth
 - a. Opportunities to engage with international global change research communities
 - b. Greater visibility to stakeholders
 - c. Participation in high-level science-policy fora
 - d. Access to Future Earth integration activities
 - e. Benefit from Future Earth global identity and communications
 - f. Become part of a unified voice to science funders



Website: www.icsu.org/future-earth
Blog: www.futureearth.info
Facebook: www.facebook.com/futureearth.info
Twitter: @FutureEarth