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A contribution to IPBES: Improving our capacity to predict global changes in biodiversity and ecosystem services

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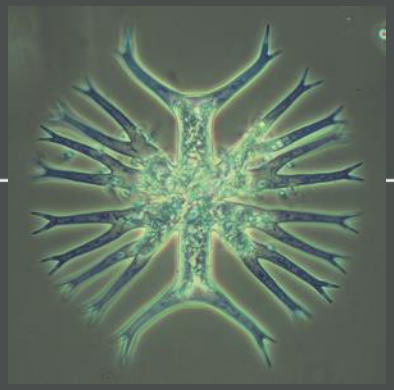
Paris, 21-22 October 2013



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Outline

- Overall context for the call
  - Policy context (IPBES, CBD)
  - Scientific context (Future Earth)

- Draft research questions




Policy context: Biodiversity science-policy interface

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Future Earth

ipbes

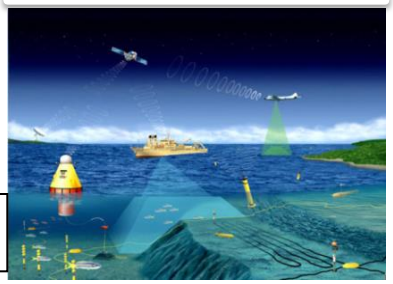
Research

Assessments

We are here

Observation

Policy



GEO BON

Convention on Biological Diversity

ICSU
International Council for Science

UNITED NATIONS
UNIVERSITY

futurearth
research for global sustainability

United Nations
Educational, Scientific and
Cultural Organization

WMO as
observer

The mission of Future Earth

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

Examples of questions Future Earth will need to answer

- How and why is the global environment changing?
- What are likely future changes?
- What are the implications for human wellbeing and other species?
- What choices can be made to reduce harmful risks and vulnerabilities, enhance resilience & create prosperous and equitable futures?

Need for a new approach

The challenges of global environmental change and sustainable development require a new approach which is:

- More integrated
- More international
- More collaborative
- Co-designed with users, funders
- More responsive to society's needs
- And which builds on the success of current international research programmes

Proposed integrated research themes

- Dynamic Planet

  - Understanding how the system works & predicting how it will change

- Global Development

  - Addressing the most pressing needs of human development (food, water, health, energy); Short term

- Transformation towards Sustainability

  - Focusing on long term transformations needed to move to a sustainable future (Long term)

Proposed cross cutting capabilities

- Observing systems
- Data systems
- Earth system models

  Build the next generation of models that better capture the dynamics of human environment interactions, feedbacks and thresholds in the Earth system and that allow for predictions of risks and change on longer time and more detailed regional scales.

- Theory development

A Collaborative Research Action

Proposed by:

- DFG (Germany)
- ANR (France)
- DIVERSITAS

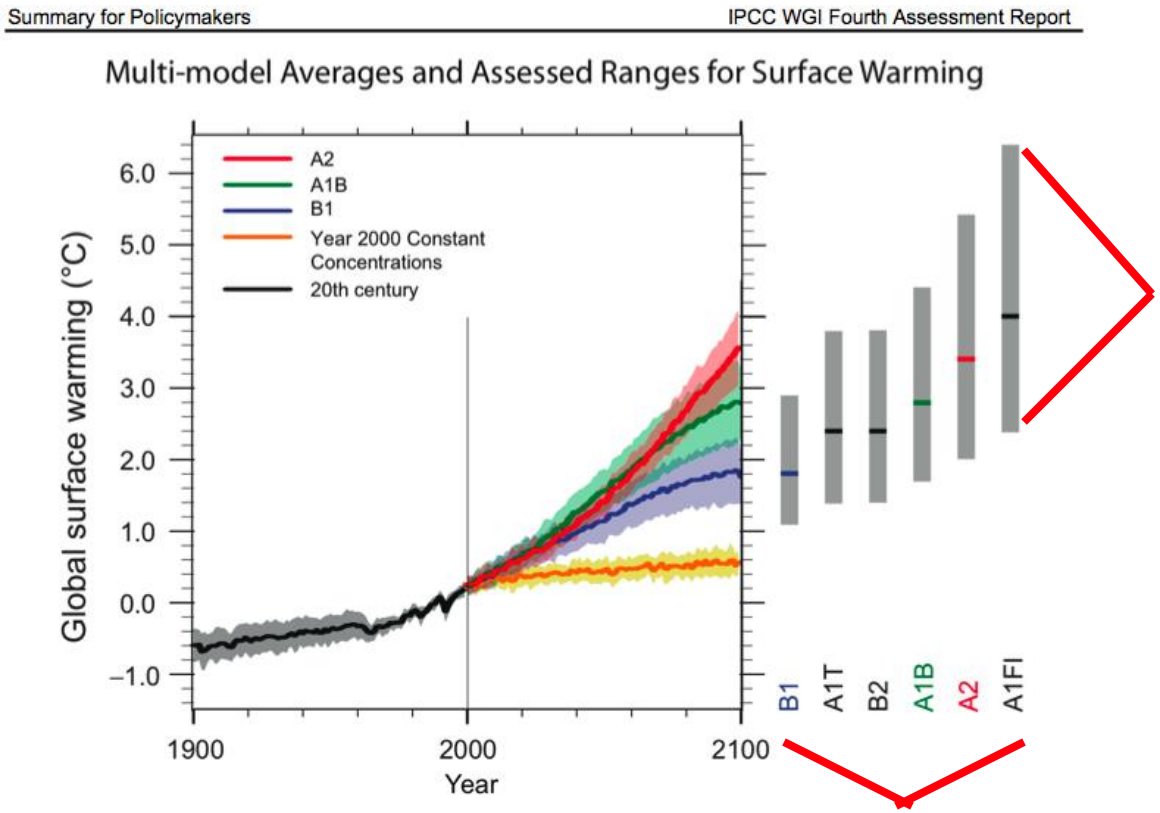
Supported by:

- IHDP
- IGBP
- IPBES
- Convention on Biological Diversity

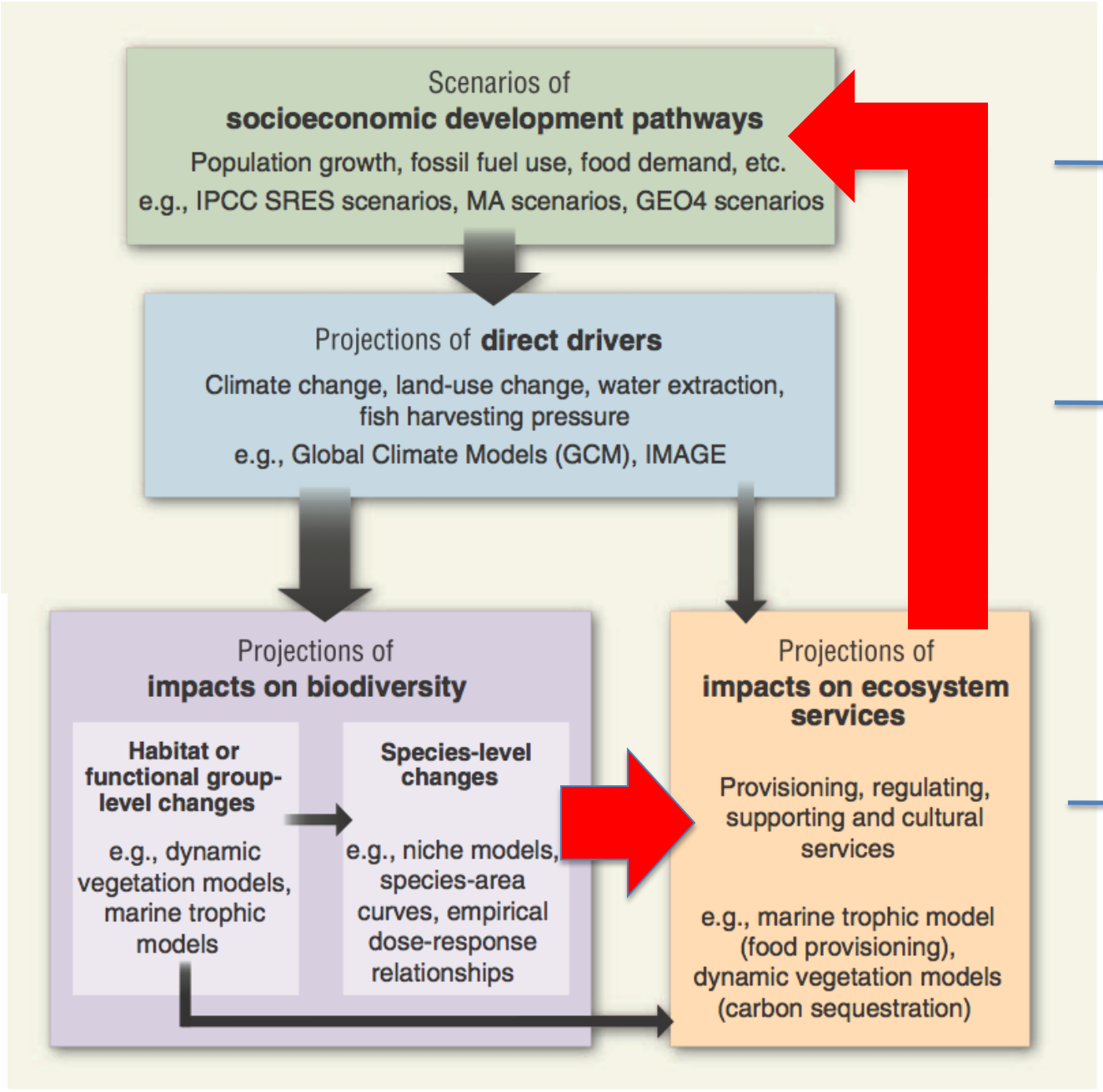
Overall goal of proposed CRA

Stimulate international collaboration to improve our capacity to model changes in biodiversity and ecosystem services as a response to various socio-economic scenarios

Projecting future changes according to several socio-economic scenarios & climate models: the IPCC approach



IPBES Terminology



'Scenarios'
of socioeconomic development

'Models'
of direct drivers

'Models'
of biodiversity And ES

'Scenarios + Models' *(= Scenarios)*

Pereira, Leadley et al. 2010. Science.

What needs to be done in terms of knowledge generation for IPBES? Intensify work on scenarios & models

- **Socioeconomic Scenarios**

- Create scenarios that explicitly take into account biodiversity
- Generate scenarios based on policy maker & stakeholder input
- Develop a framework for cross-scale consistency between regional & global scenarios

- **Models of biodiversity and ecosystem services**

- Define common metrics for models and data
  (parameterization, validation, policy relevance)
- Intercomparison of models to better understand models & quantify uncertainty
- Couple biodiversity and ecosystem services in models
- Link and harmonize regional and global analyses
- Account for a wide range of drivers
- *Include species interactions*

- **Scenarios + Models** - Develop models with **dynamic feedbacks** between scenarios, models of drivers, models of biodiversity & models of ecosystem services
- Evaluate tipping points in coupled human-environment systems

Leadley et al. 2010, Pereira et al. 2010, Dawson et al. 2011, Bellard et al. 2012, EU COST Harmbio, Tokyo IPBES workshop 2011, etc.

Proposed objectives of CRA (initial proposal)

- Making socio-economic scenarios more relevant for decision making
- Improving confidence in and the usefulness of projections of biodiversity and ecosystem services and their impacts on human well-being
- Using scenarios and models of biodiversity and ecosystem services to help anticipate, avoid, and manage disruptive global environmental change
- Using scenarios and models to provide insights into the institutional, economic, and behavioral changes to enhance the capacity of social–ecological systems to adapt and support biodiversity and ecosystem services under global change

Complementary objectives (pre-scoping)

- Incorporating community and ecosystem level interactions into models
- The need to link local, regional and global levels for ecological, economic and social models
- Being explicit about model uncertainties
- Increase understanding of feedbacks, tradeoffs and co-benefits
- Integrating marine and terrestrial biodiversity/ecosystem models
- Incorporating up-to-date observations and monitoring data into ecological, economic and social models

To conclude

Models & scenarios of BES changes represent a strategic & timely topic for a Belmont CRA:

- There is a high demand: policy context
- There is a need for collaboration across disciplines, countries, etc.

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Thank you!