The Global Carbon Project:

Integrating Humans, Climate, and the Natural World

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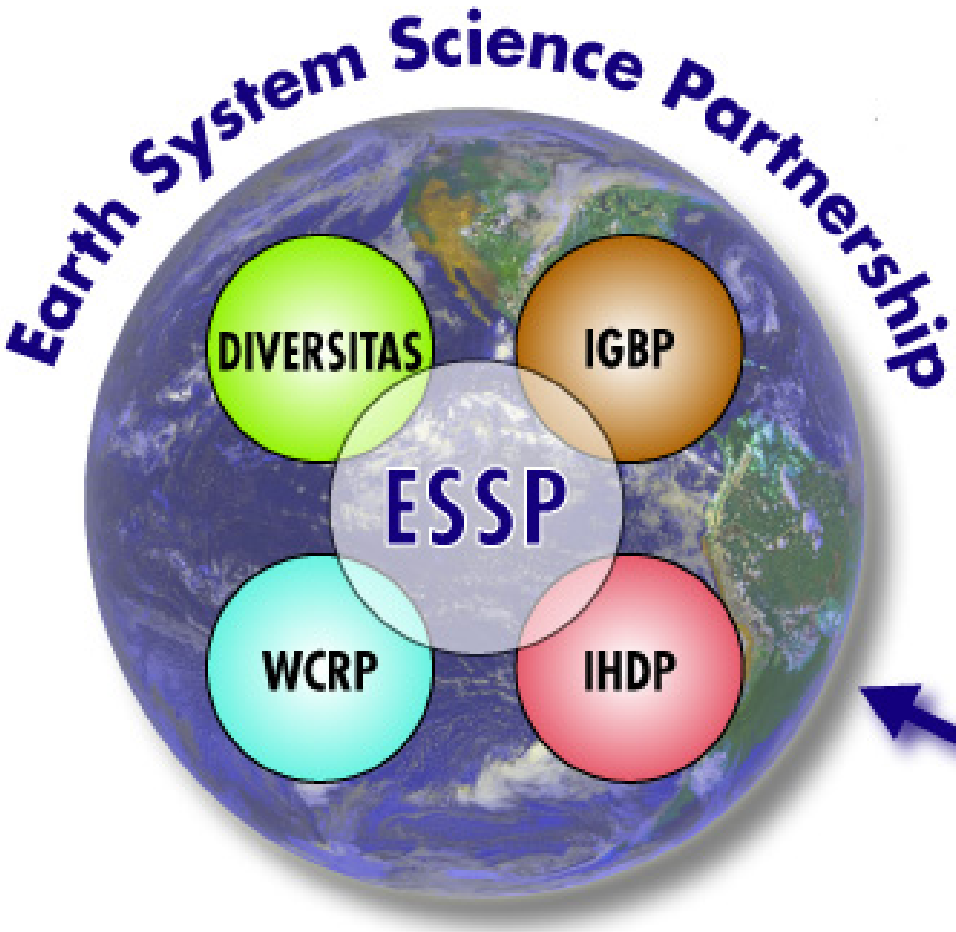
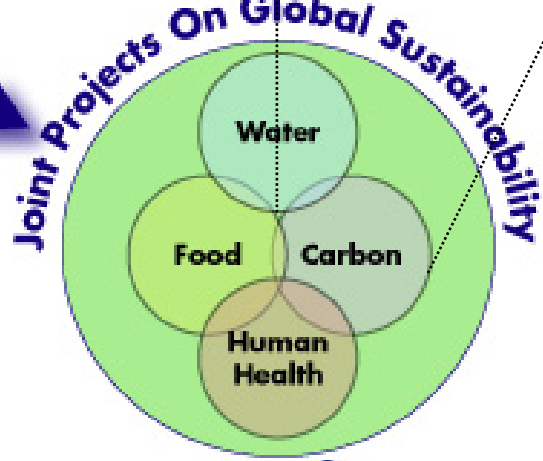
The Programmatic Partnership



Carbon-Climate-Human system

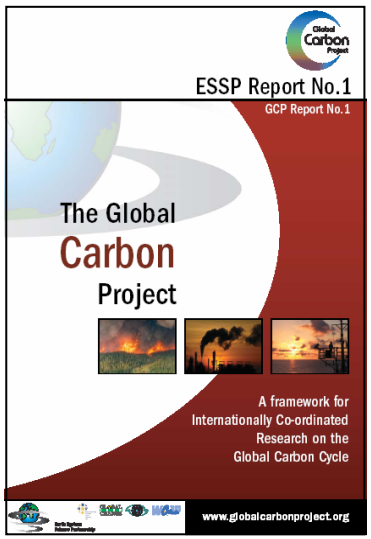
Global Carbon Project



GCP Goal and the Science Framework

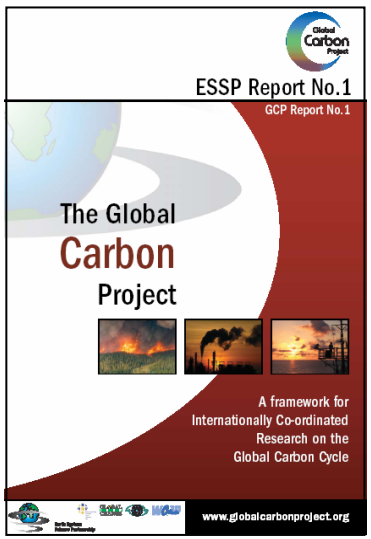
To develop comprehensive, policy-relevant understanding of the global carbon cycle, encompassing its natural and human dimensions and their interactions.

English



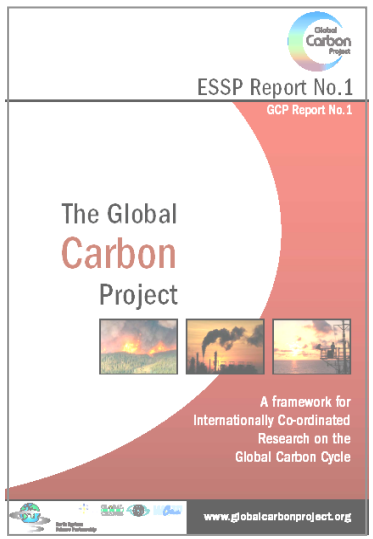
Oct. 2003

Chinese



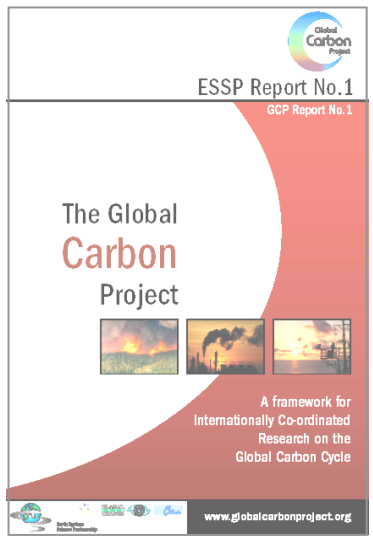
Nov. 2004

Russian



June 2005

Spanish



June 2005

Global Carbon Project

Earth System Science Partnership

The GCP Mandate

1. To develop a research framework for integration of the biogeochemical, biophysical and human components of the carbon cycle.

2. To facilitate coordination among regional and national carbon programs to improve observation and experimental design, comparability, and exchange of information and tools.

3. To synthesize and integrate components and processes of the global carbon cycle in a multiple constraint model-data assimilation framework.

4. To foster research on the carbon cycle in regions that are poorly understood but have the potential to play an important role in the global CC.

GCP Implementation Plan

1. Patterns and Variability

1.1. **Enhancing Observations**
- Coordination & Standardization

1.2. **Model-Data Fusion**
- Model-data fusion techniques

1.3 **Carbon Budgets**
- Methodologies, Sector Analyses

2. Mechanisms & Feedbacks

2.1. **Integrated C Sink Mechanisms**
- Multiple mechanisms and interactions

2.2. **Emergent Properties C-Climate**
- Paleo and Forward

2.3. **Emergent Properties C-C-Hum.**
- New modeling approaches

3. Future & C Management

3.1. **Mitigation Options**
- Control points land, ocean, FF

3.2. **C Management & Sustainabil.**
- Portfolios and sustainable develop.

3.3. **Regional/Urban Development**
- C consequences and Management

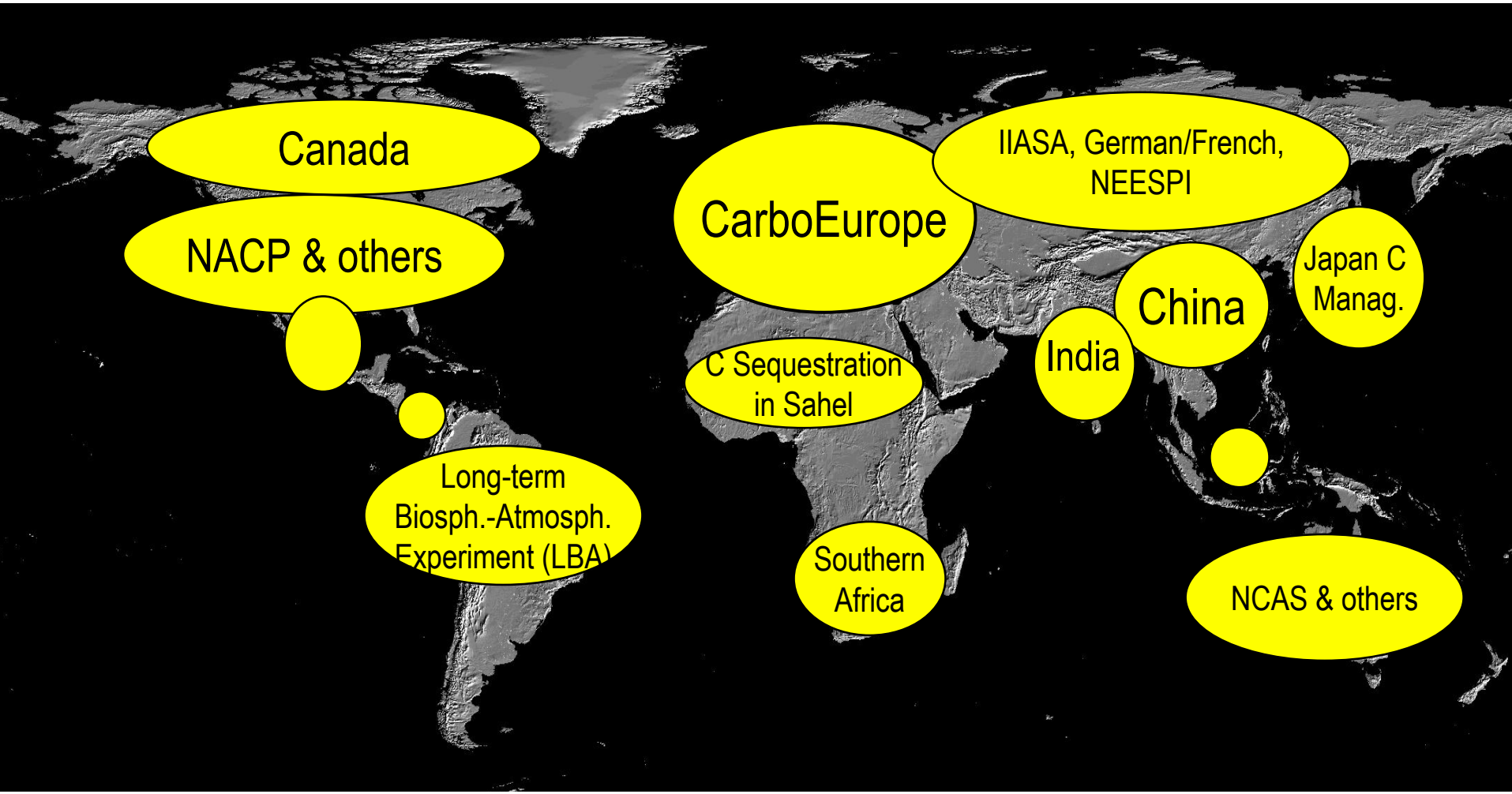
Activities most Relevant to NEESPI

1. Dynamic Full Carbon Budgets

2. Vulnerabilities of the Carbon-Climate System

3. Terrestrial Carbon Cycle Management

Dynamic Regional Carbon Budgets



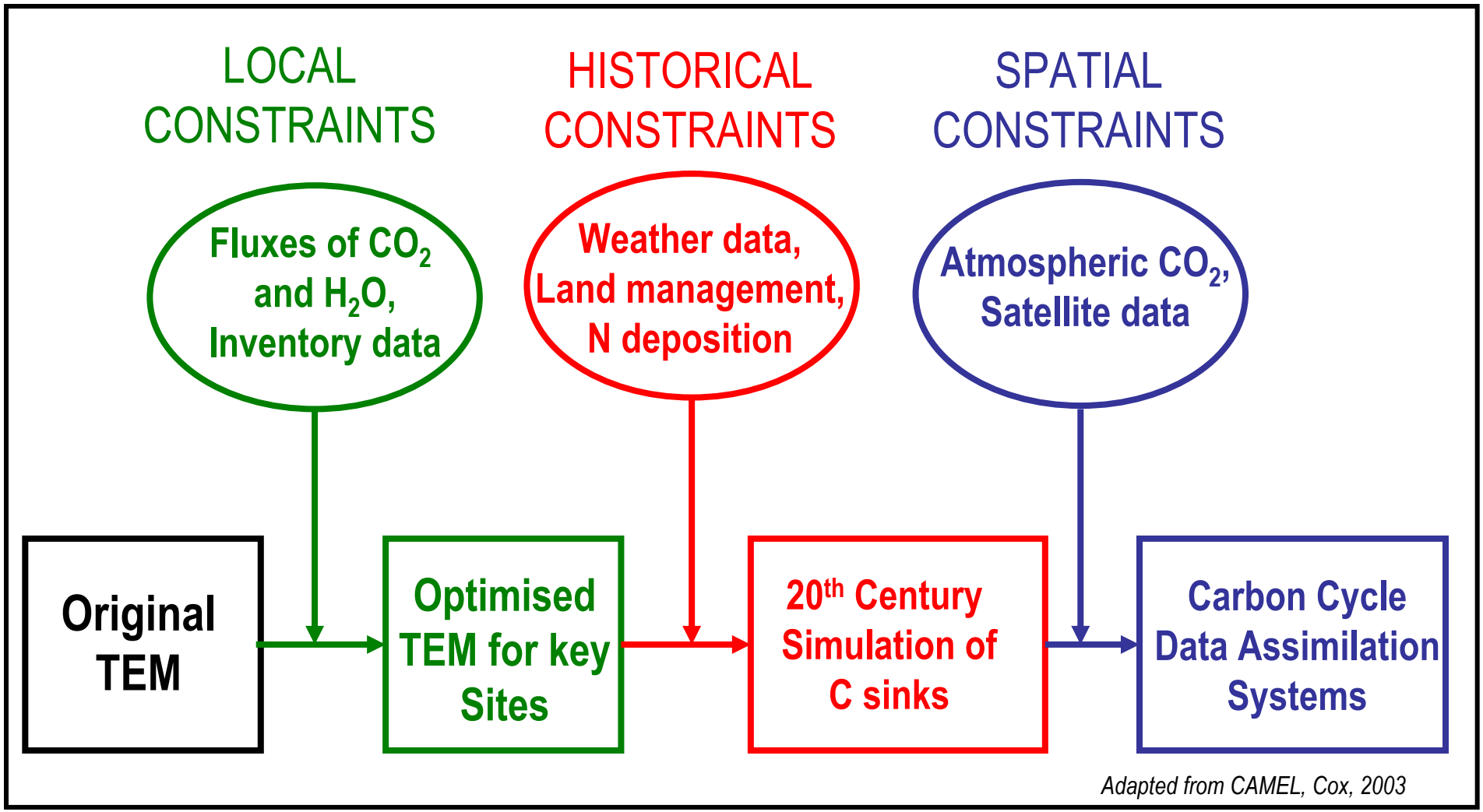
1. Terrestrial Dynamic Regional Carbon Budgets

1. To foster the development of dynamic regional carbon budgets:
    - Scientifically robust
    - Comprehensive (full carbon accounting: all sectors)
    - Dynamic (in space and time)
        - processes for prognosis
        - scales consistent with policy requirements and the use of top-down constraints

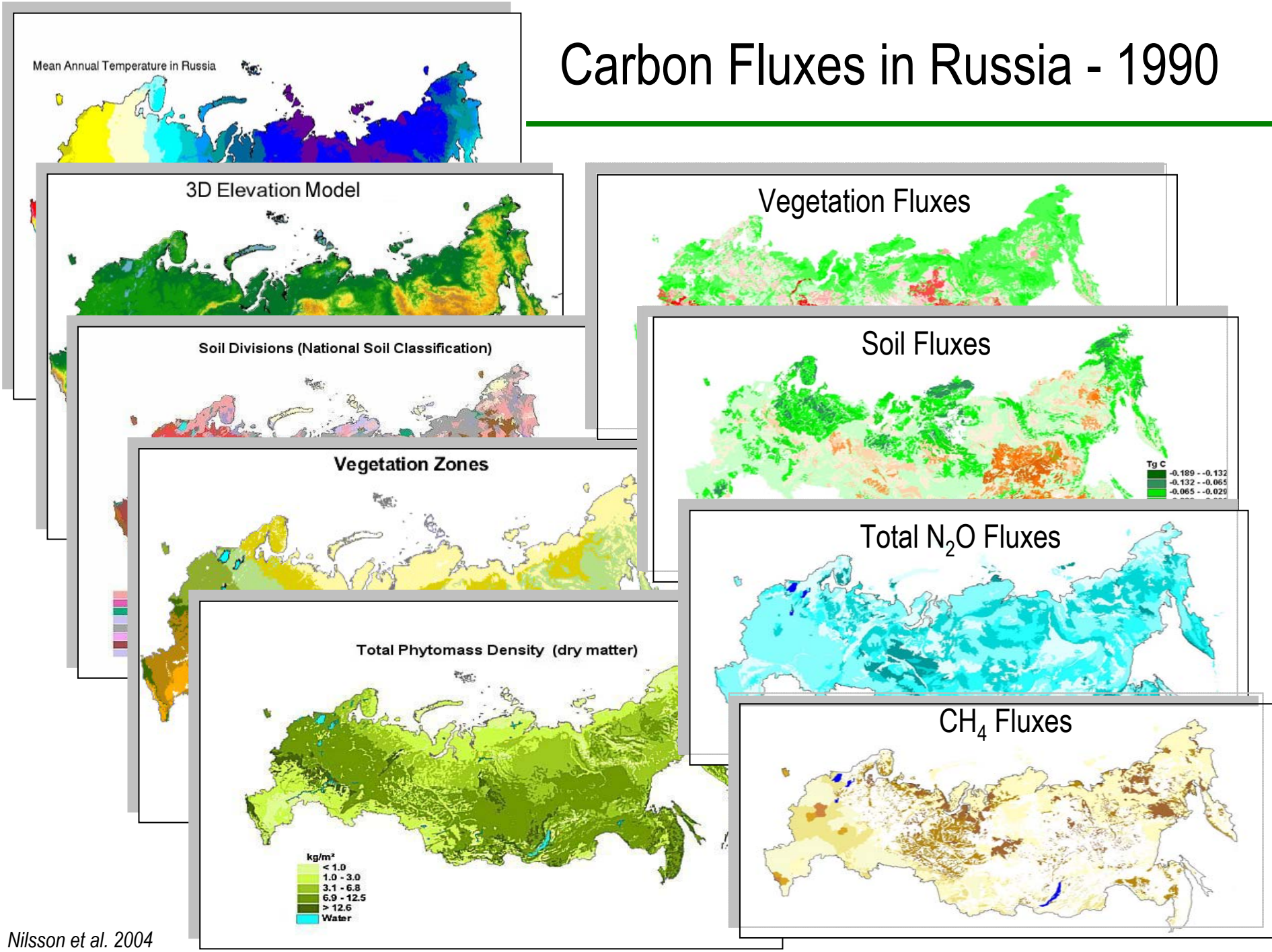
2. To foster harmonization among approaches and estimates of carbon stocks and fluxes to enable consistency across regions and nations.

3. To foster the development of dynamic carbon budgets in regions where do not exist, by promoting:
    - harmonization of new methodologies
    - transfer of existing methodologies and knowledge

C Cycle Multiple Constraint Model-Data Assimilation

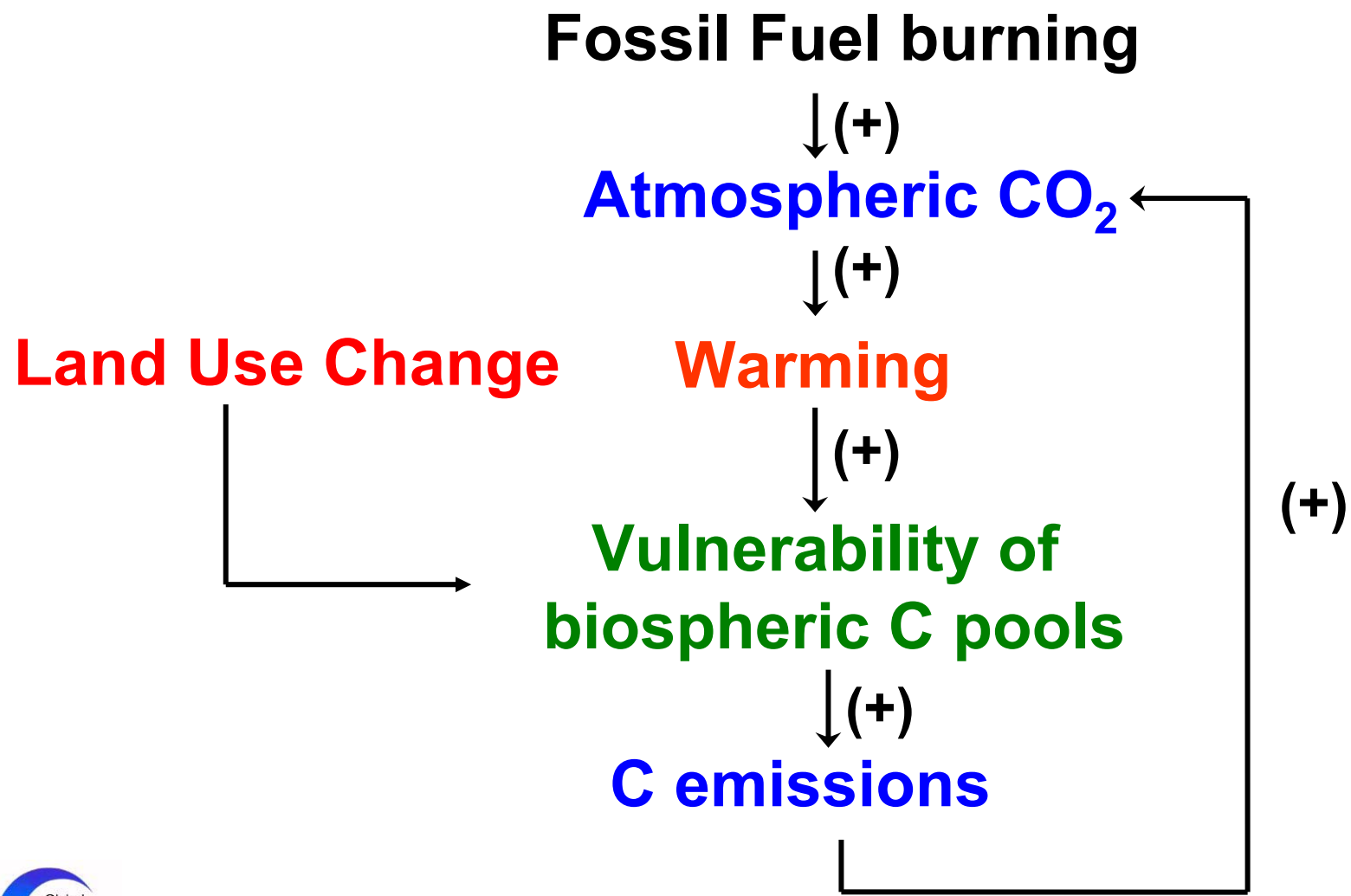


Carbon Fluxes in Russia - 1990

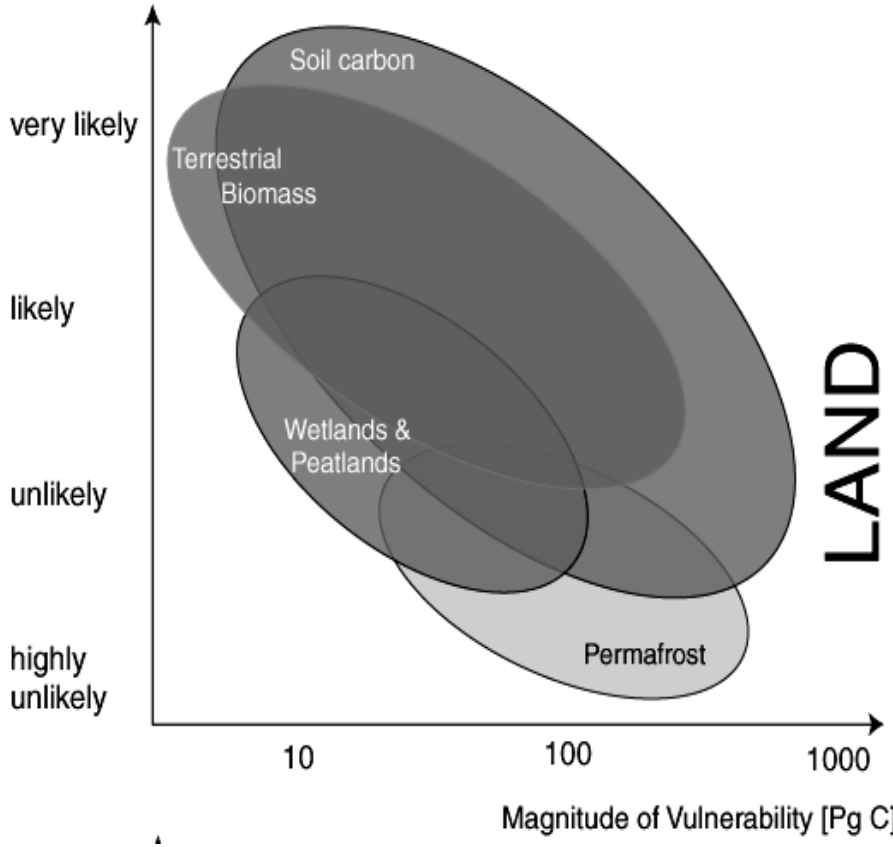


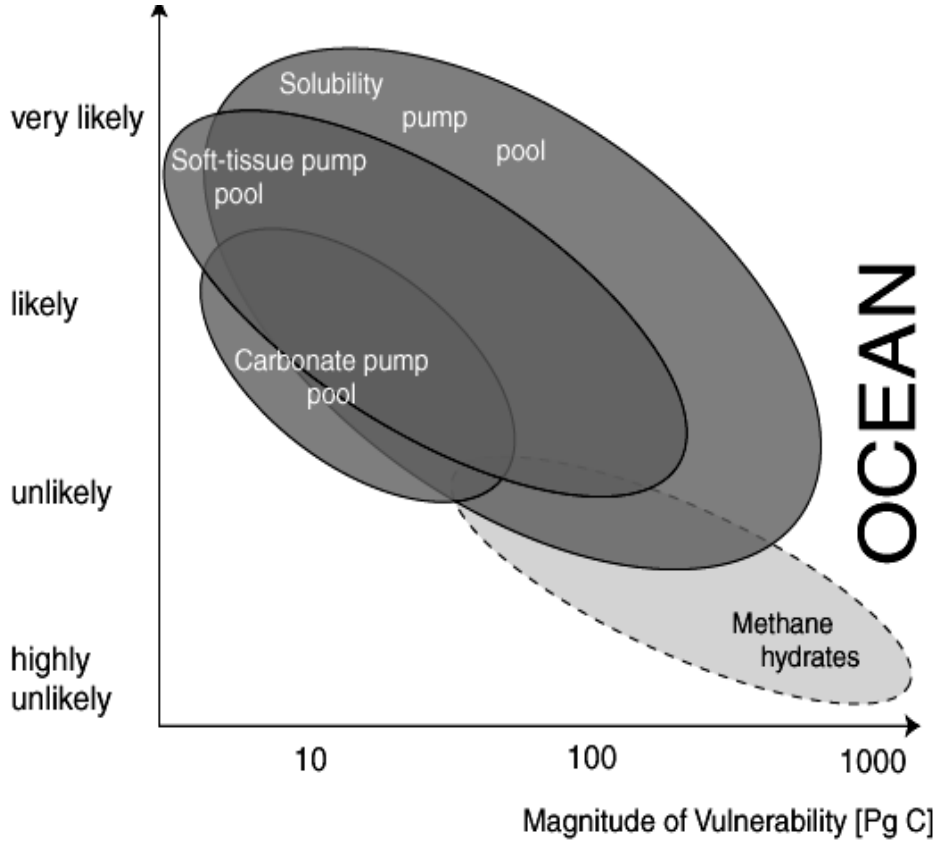
Nilsson et al. 2004

2. Vulnerabilities of the Carbon-Climate System



C-Pools at risk in the 21st Century





- Risk over the coming century of up to 200 ppm of atmospheric CO_2 (rivaling the FF).
- Not included in most climate simulations.

Gruber et al. 2004

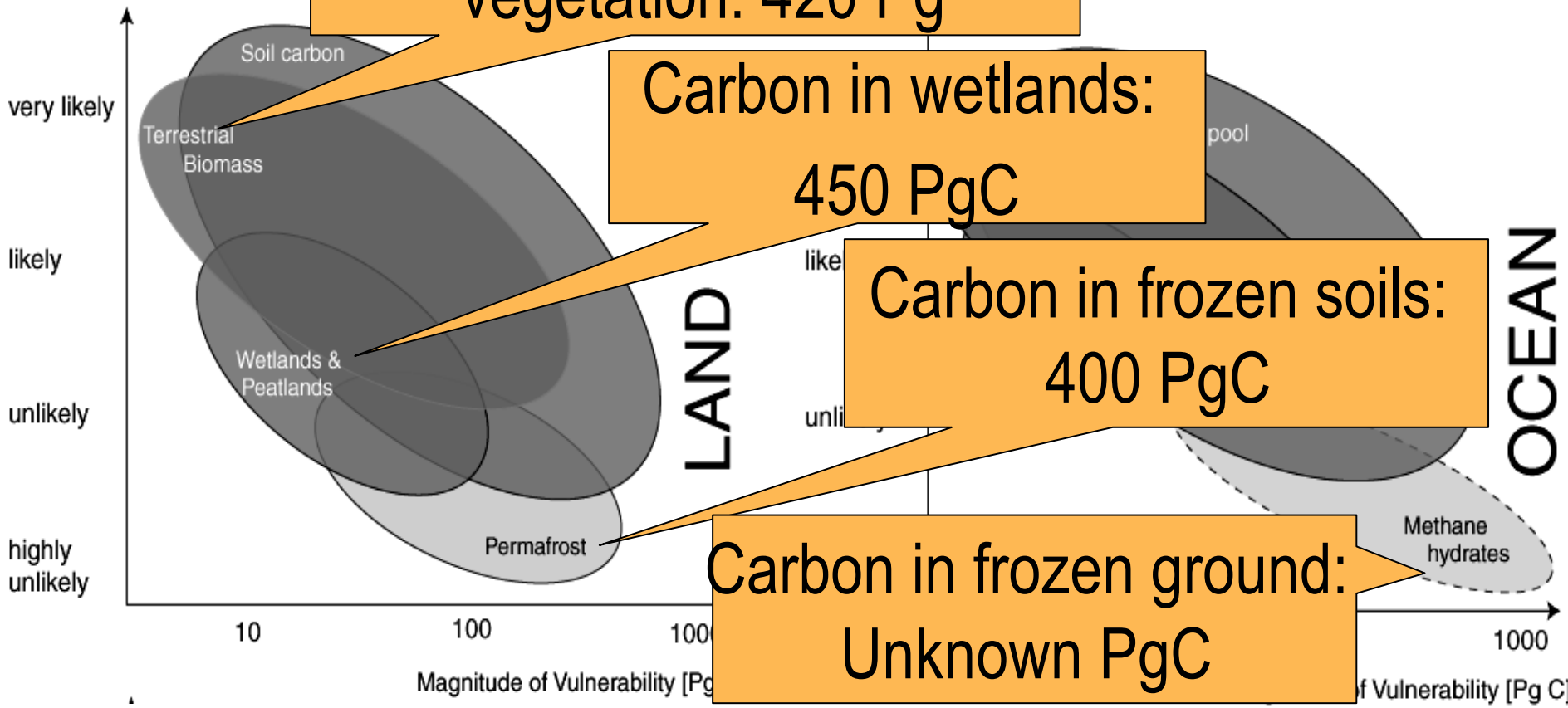
C-Pools a

Carbon in tropical/boreal vegetation: 420 Pg

Carbon in wetlands: 450 PgC

Carbon in frozen soils: 400 PgC

Carbon in frozen ground: Unknown PgC



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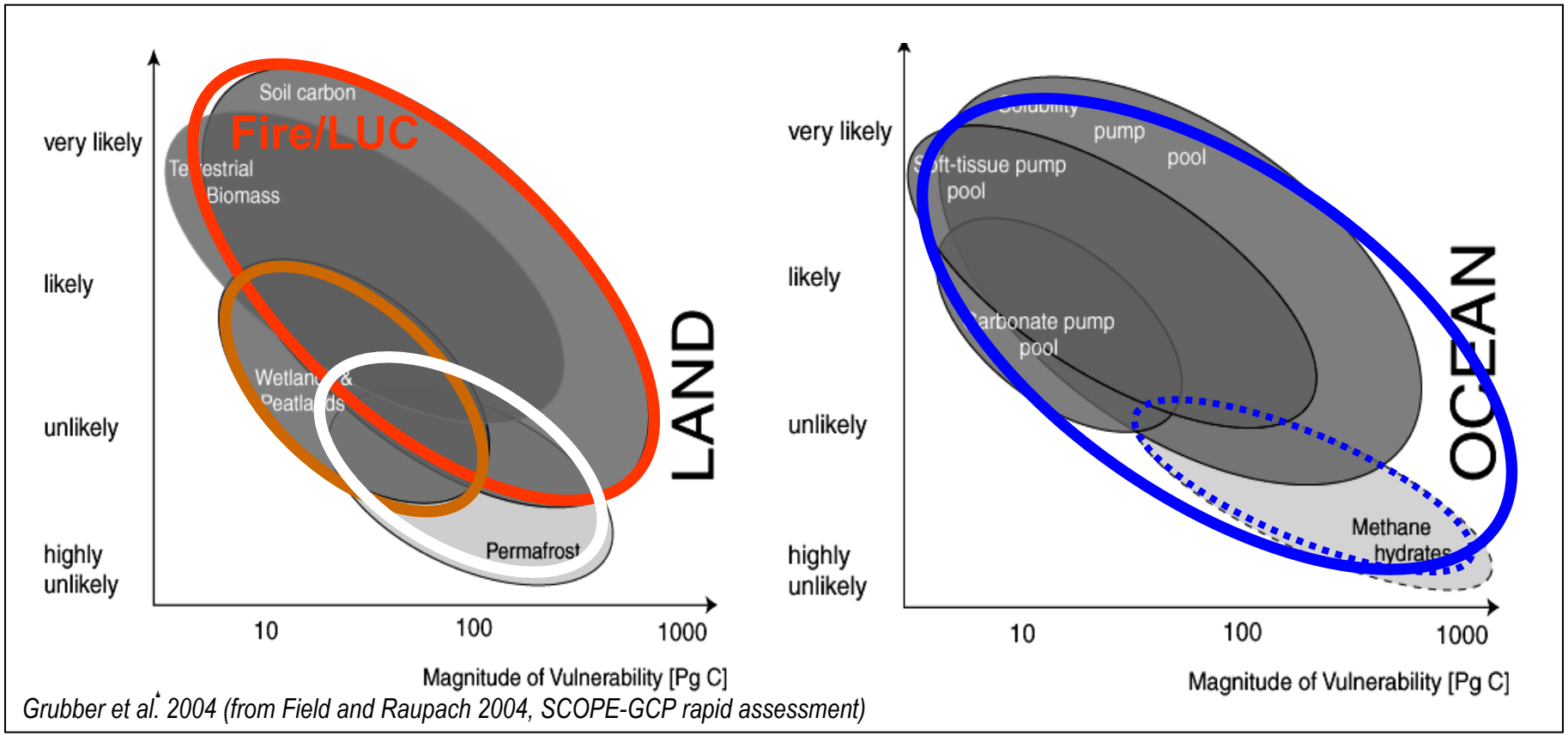
Gruber et al. 2004

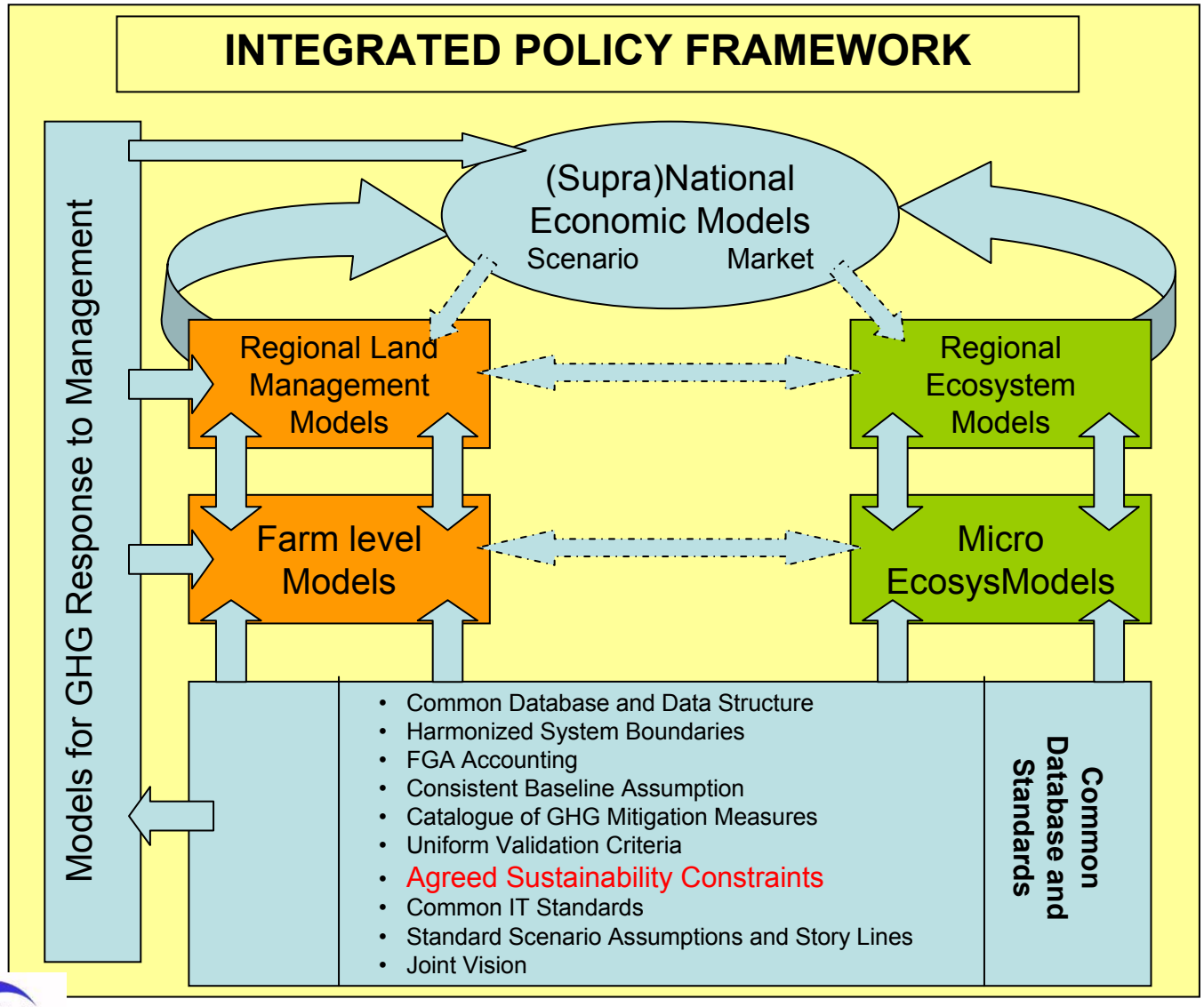
Assessment of Vulnerabilities in the Carbon-Climate System



Grubber et al. 2004 (from Field and Raupach 2004, SCOPE-GCP rapid assessment)

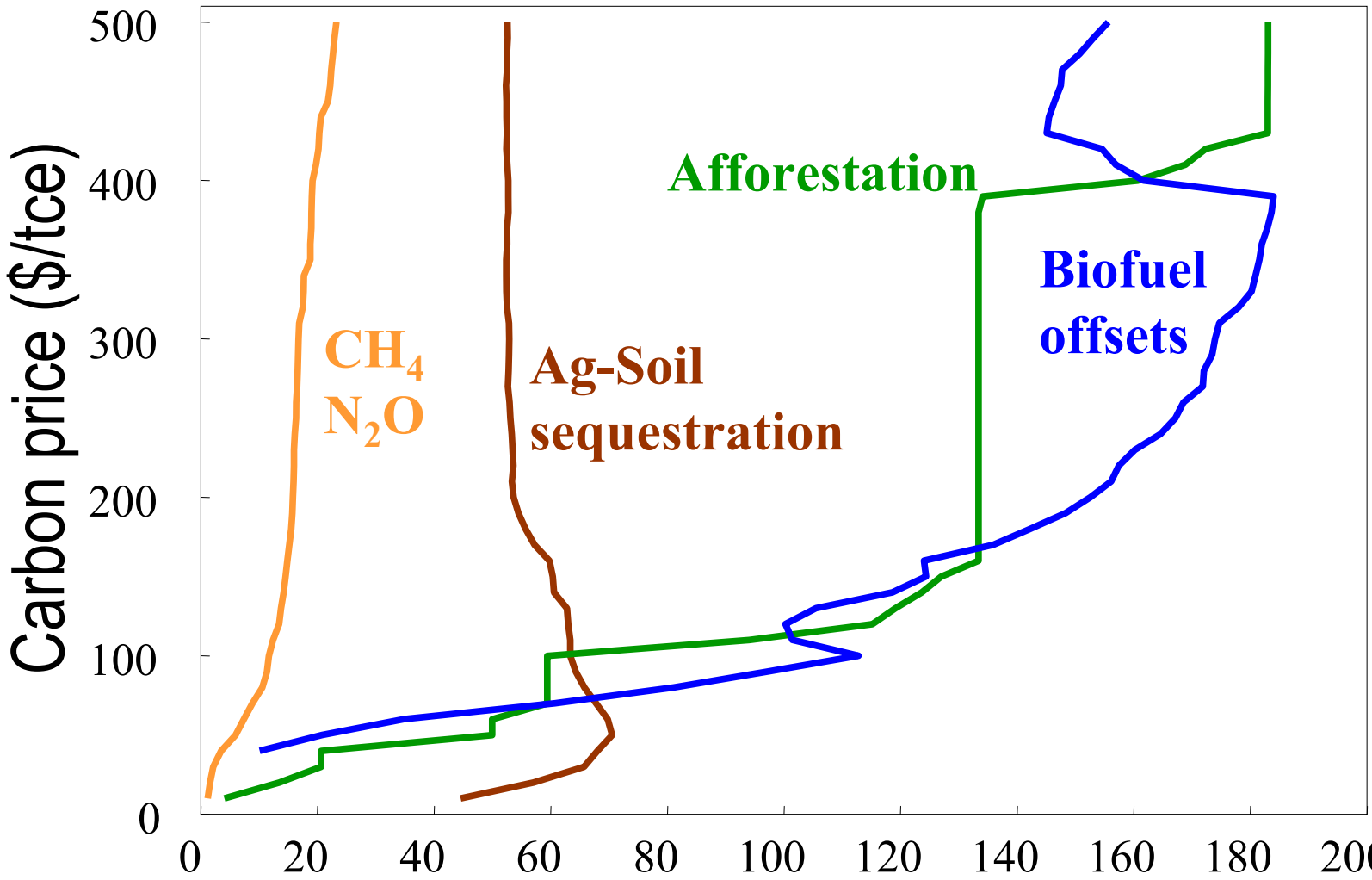
- Quantify the extent of these pools and their carbon content.
- Assess the processes affecting the balance.
- Assess the potential net C emissions.
- Analyze the impacts of these C releases on atmospheric [CO_2] and climate change.

3. Terrestrial Carbon Cycle Management



Goal:
To identify and quantify points of intervention in the terrestrial carbon cycle in a consistent manner with the energy and industrial sectors in order to safeguard sustainable development of the coupled carbon-climate-human system.

Mitigation Strategy Equilibrium



Oberstainer et al. 2004

www.GlobalCarbonProject.org