

COSMOS

Community Earth System Models

A community network to foster development of Earth System Models

- COSMOS
 - Intends to enable the Earth system modeling community to answer questions they could not have answered before; this will support decision makers
 - Is an international network of interest groups with excellent expertise; this network will help to integrate the community
 - Is agreeing on a Memorandum of Understanding; this will have an aligning function for the members of the COSMOS network

Scientific Questions We can ask

- How will (human-driven) changes in the nitrogen cycle perturb the carbon cycle?
- What has maintained the past oscillations in atmospheric CO₂ between 180 and 280 ppm?
- How does climate change impact air quality and vice versa?
- What are the stability problems of Earth's subsystems of varying complexity? (e.g. atmosphere, ocean, atmosphere/ocean, atmosphere/ocean/cryosphere, ...)
- What would the implication of an ice-free Arctic be for regional climate in Europe?
- How can COSMOS ESMs contribute to ES monitoring?
- Does location of emission matter?
- What are agreeable common standards in Earth System Modelling?

(Scientific) Questions

We are asked

- How will the Earth system respond to human-induced forcing over periods of decades to Millennia?
- Will climate change affect the food production system in Europe and vice versa?
- What is the impact of climate changes on biodiversity?
- Can we predict the evolution of the Earth system?
For how long?
- Does it matter for the climate if people live in mega-cities or in the country?
- What is the carrying capacity of the Earth?
- Can we quantify the risk of not having enough water of quality?
- What would the implication of an ice-free Arctic be for Europe ?
- How can ESMs contribute to ES monitoring?

Network

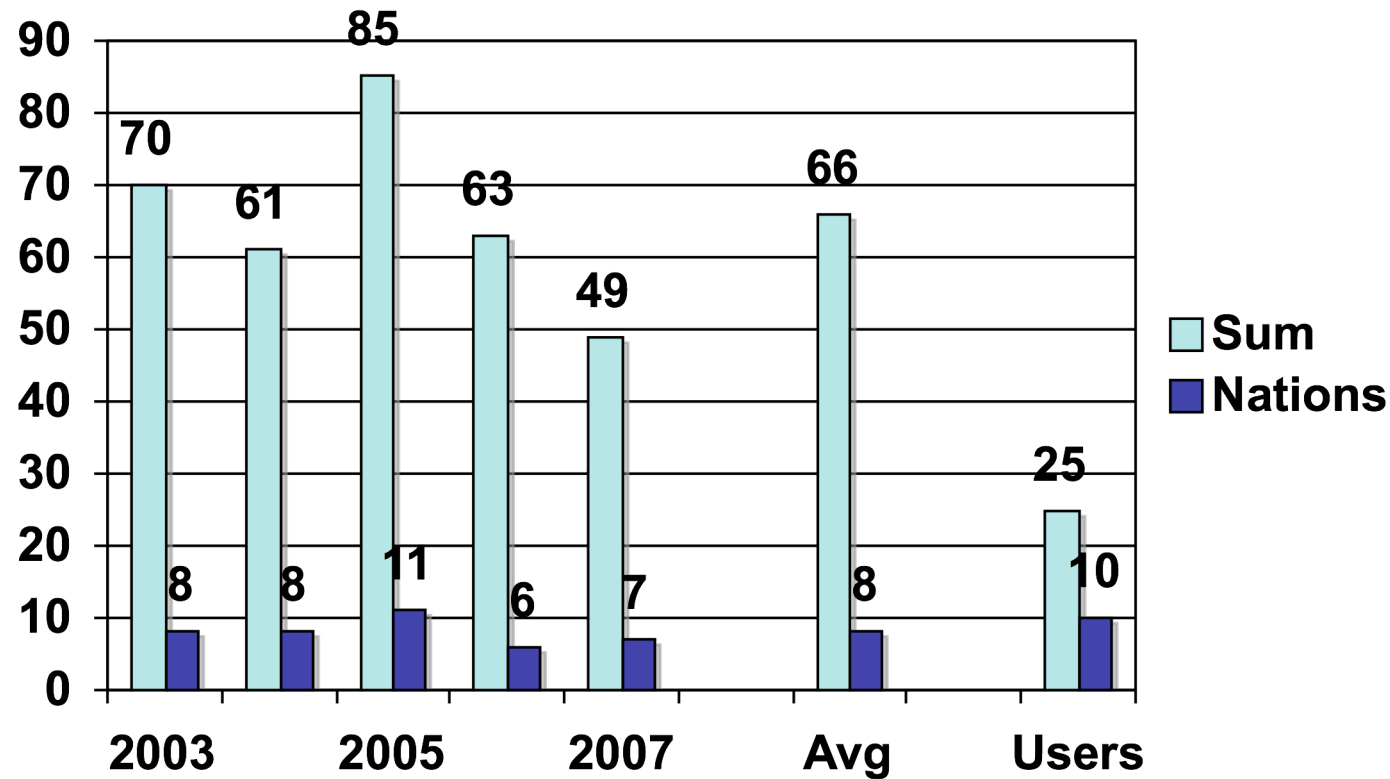
- Meetings
 - Since 2003
 - 60 - 80 participants each
 - European coverage
- Chairs
 - FMI, MPI-M, (Uni-HH), DLR,
- In the Board
 - FMI, MPI-M, (Uni-HH), DLR, MPI-CH, MPI-BGC, SMHI, PIK, FUB
- COSMOSv.1
 - ~ 30 institutions
 - 10 countries
- COSMOS data to be expected
 - Millennium
 - Supervolcano

Memorandum of Understanding

- Foster development and evaluation of state-of-the-art climate and Earth system models
- Facilitate focused model inter-comparison in order to assess and improve these models
- Encourage exchanges of software and model results
- Help to establish the necessary computational resources

To be discussed and signed 2007

Meeting Participation



COSMOS Activities

2006 - 2007

- Agreement to merge MZ and HH development lines of atmospheric chemistry components
- Decision for MZ as meeting location 2007
- Rethink layout
 - Project → Network
- Restructure cosmos
 - Board
 - Activities
 - Office

COSMOS Board, up to 12

Chair: Martin Claussen; Uni HH, MPI-M
Co-Chair: Heikki Järvinen; FMI
Co-Chair: Robert Sausen; DLR, IAP

Martin Heimann; MPI-BGC
Rupert Klein; PIK
Jos Leliefeld; MPI-CH
Jørgen Nilsson; SMHI
Uwe Ulbrich; FUB

The Scientific Director*: Daniela Jacob; MPI-M

Nominees:

* ex-officio member

• Scientific Director
Daniela Jacob, MPI-M

• Project Manager
Reinhard Budich, MPI-M

• Model Support
1 p experimentation
1 p implementation

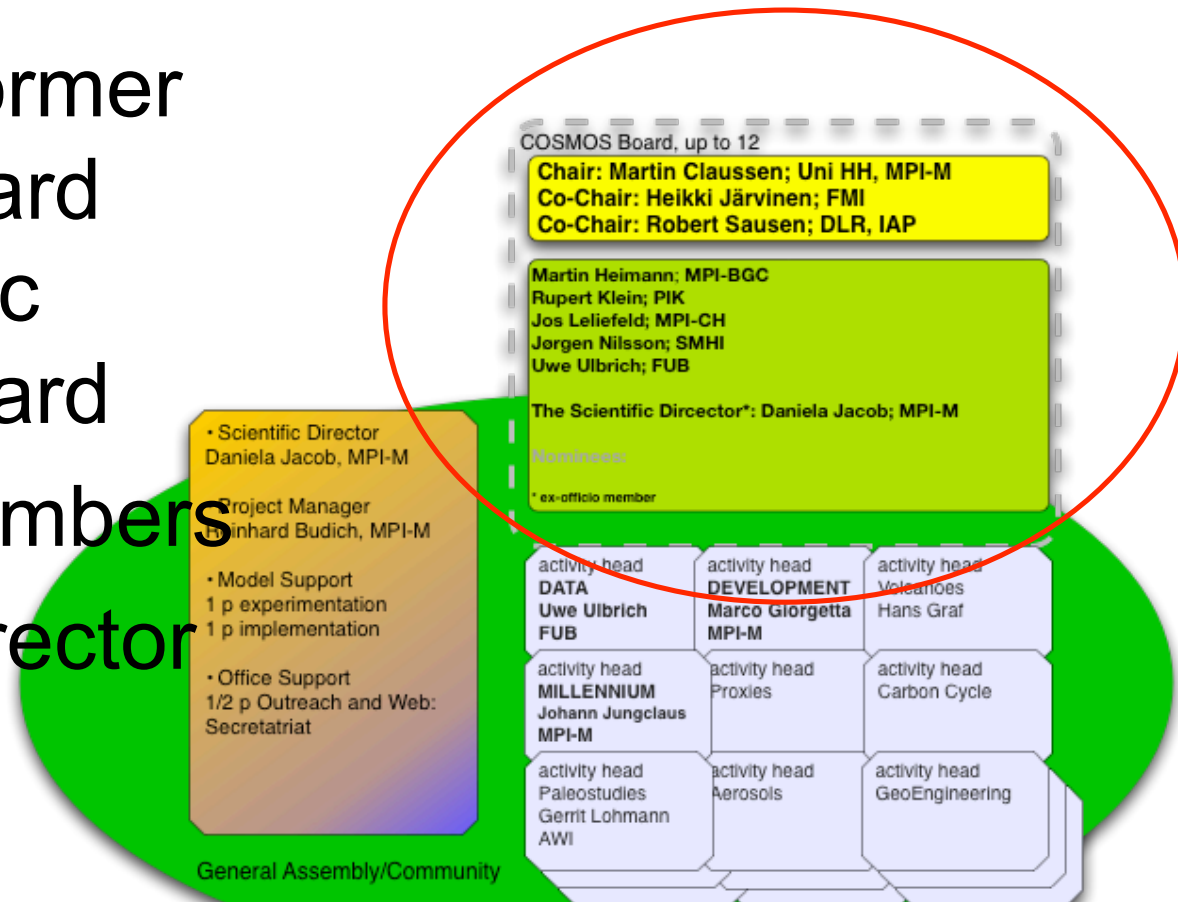
• Office Support
1/2 p Outreach and Web:
Secretariat

activity head DATA Uwe Ulbrich FUB	activity head DEVELOPMENT Marco Giorgetta MPI-M	activity head Volcanoes Hans Graf
activity head MILLENNIUM Johann Jungclaus MPI-M	activity head Proxies	activity head Carbon Cycle
activity head Paleostudies Gerrit Lohmann AWI	activity head Aerosols	activity head GeoEngineering

General Assembly/Community

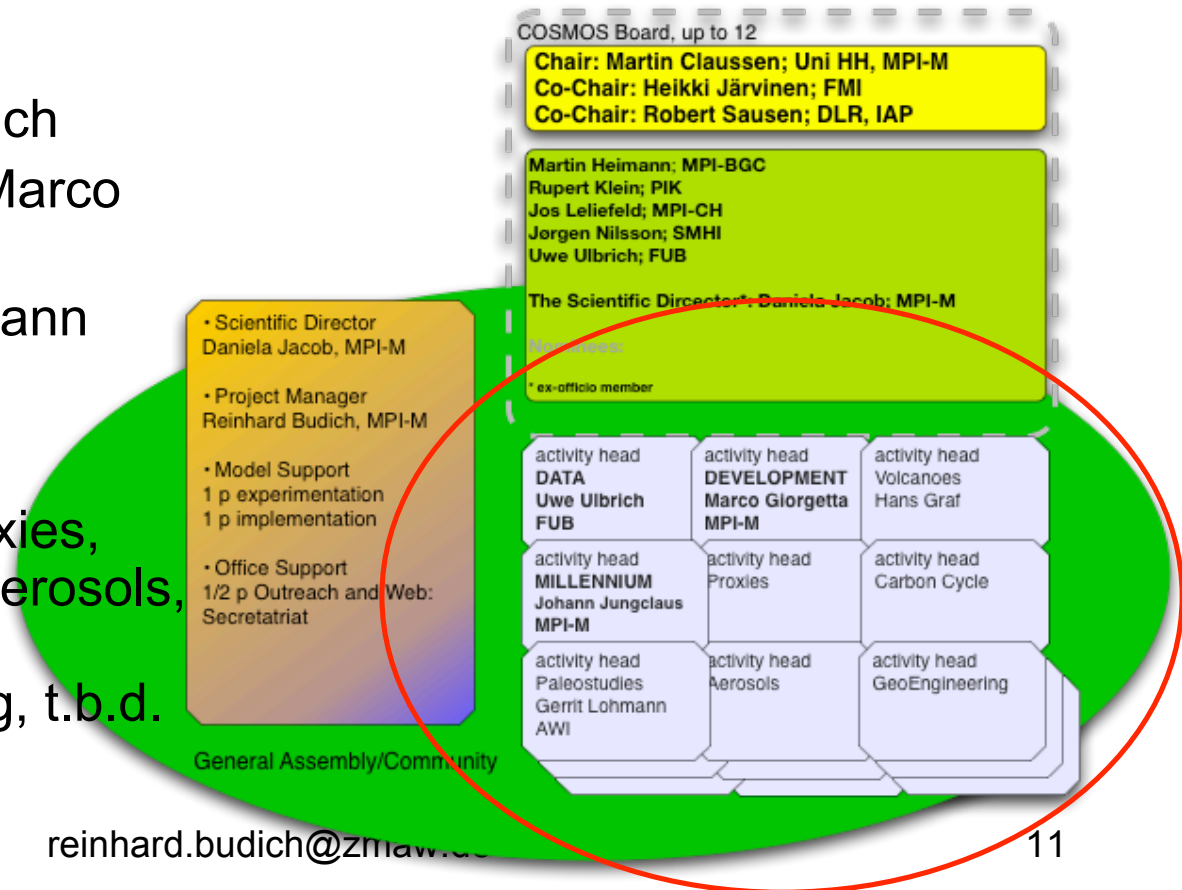
Board

- Integrates former Steering Board and Scientific Advisory Board
- Up to 12 members
- Scientific Director as ex-officio member



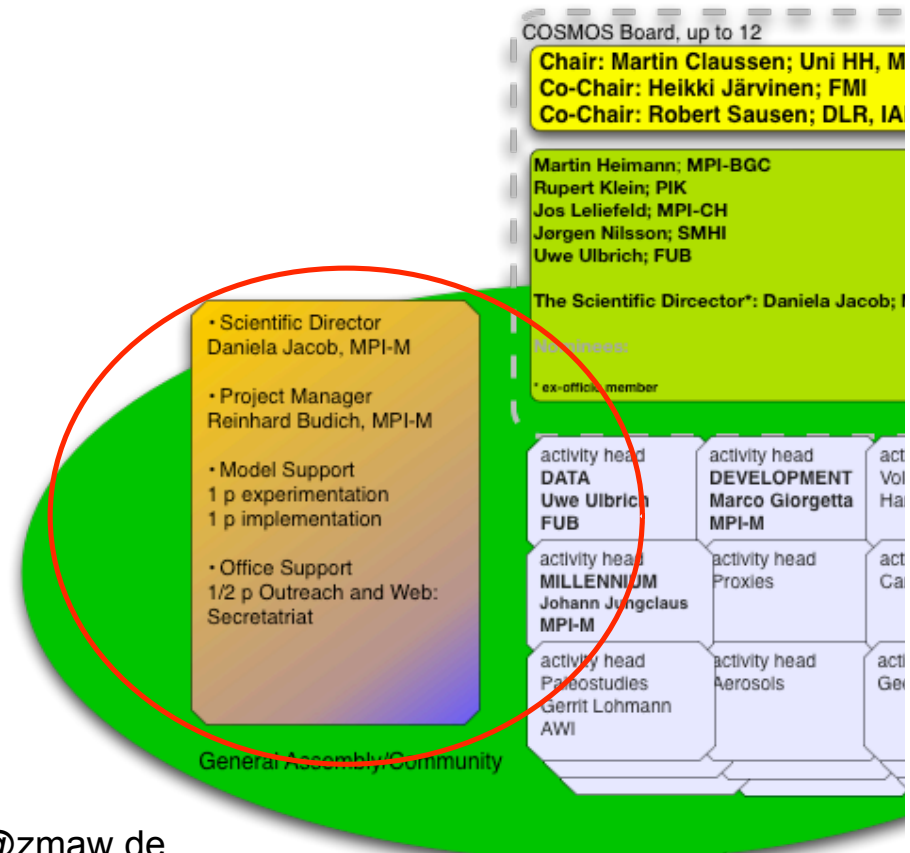
Activities

- Former Working groups
- Established:
 - Data, Uwe Ulbrich
 - Development, Marco Giorgetta
 - Millennium, Johann Jungclaus
- Propositions:
 - Volcanoes, Proxies, Paleostudies, Aerosols, Carbo Cycle, GeoEngineering, t.b.d.



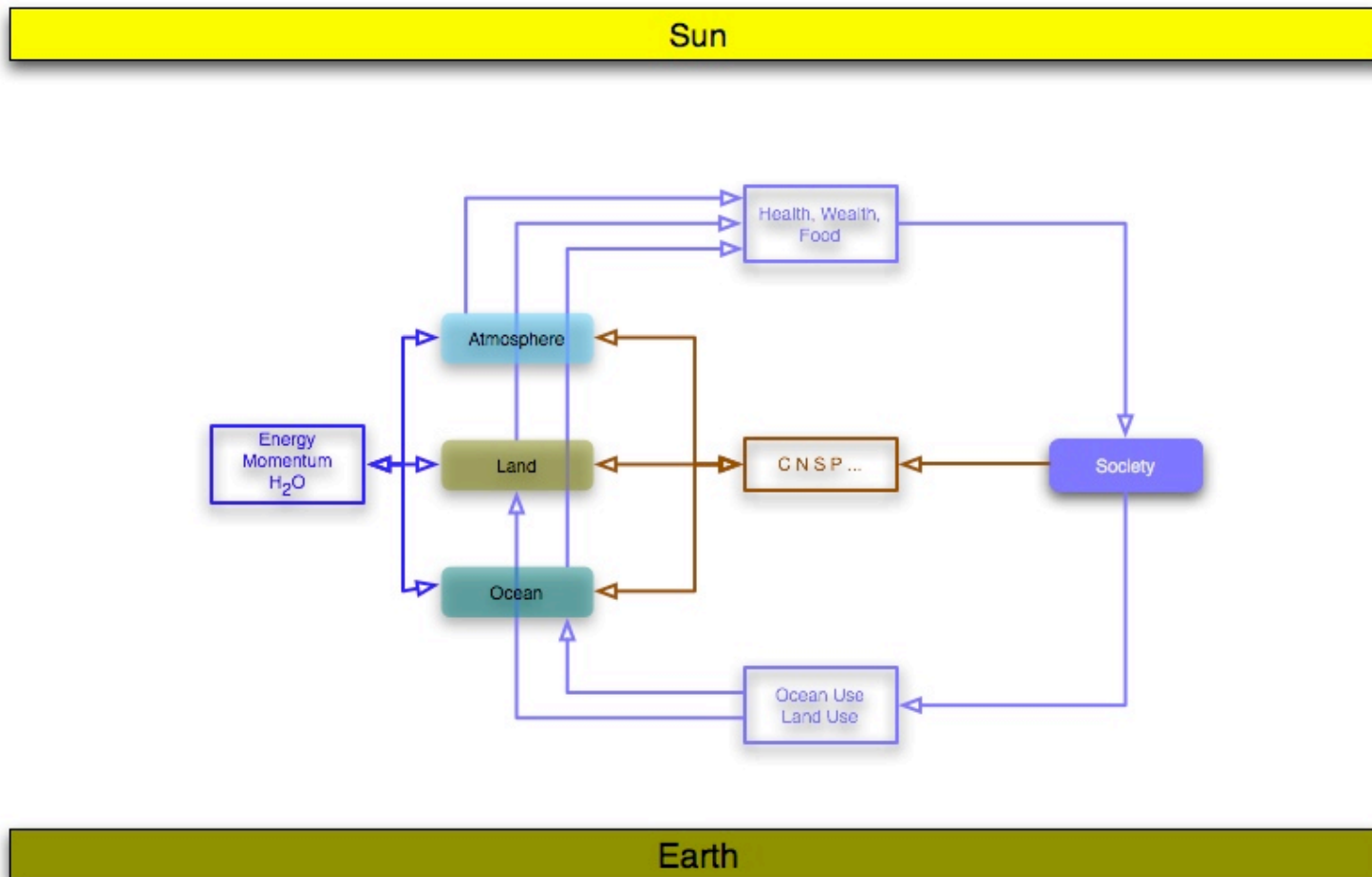
Office

- Scientific Director
- Project Manager
- Office support
- T.b.d.: Model Support



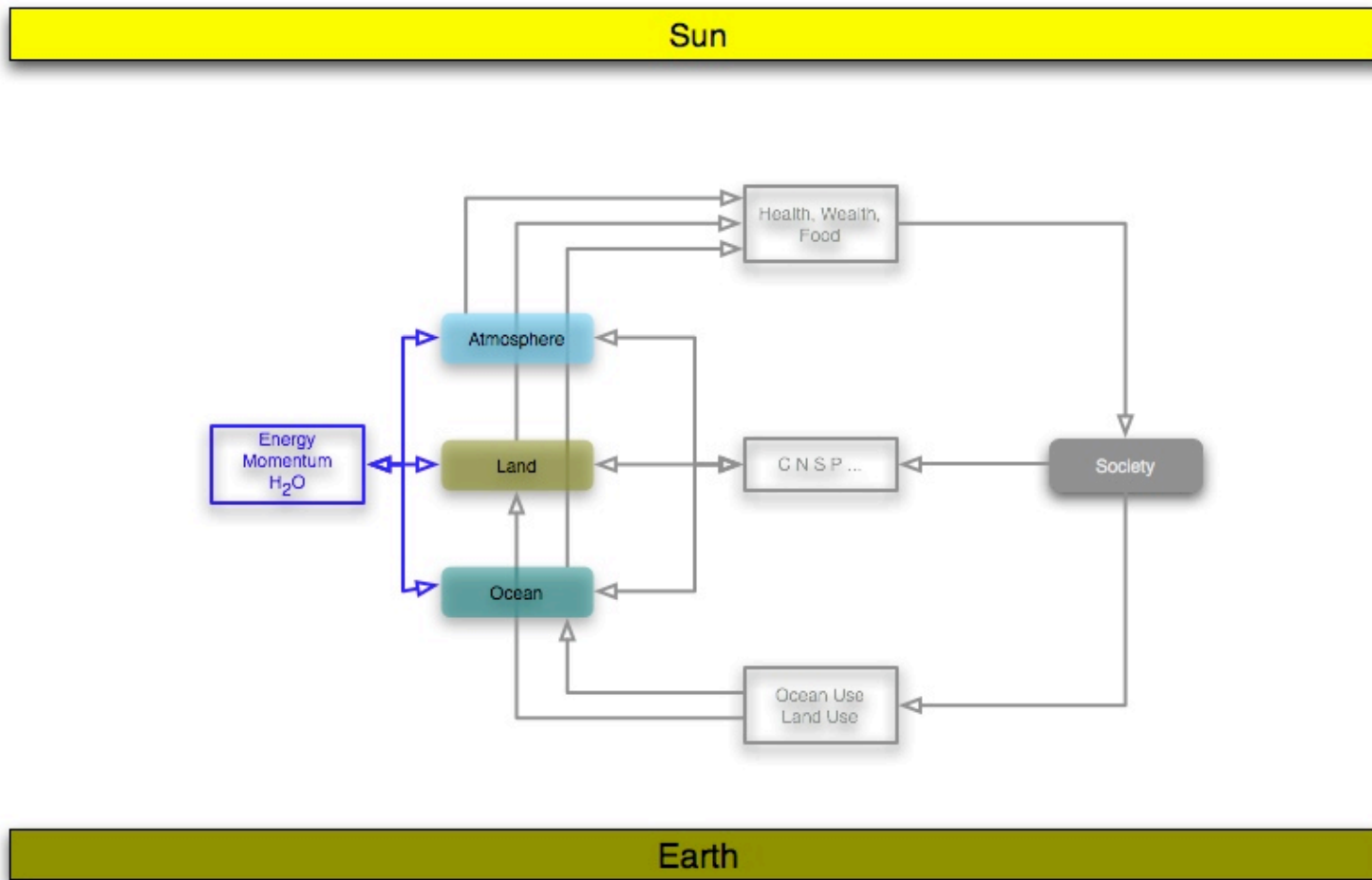
SunEarthSystem

Sun Earth System



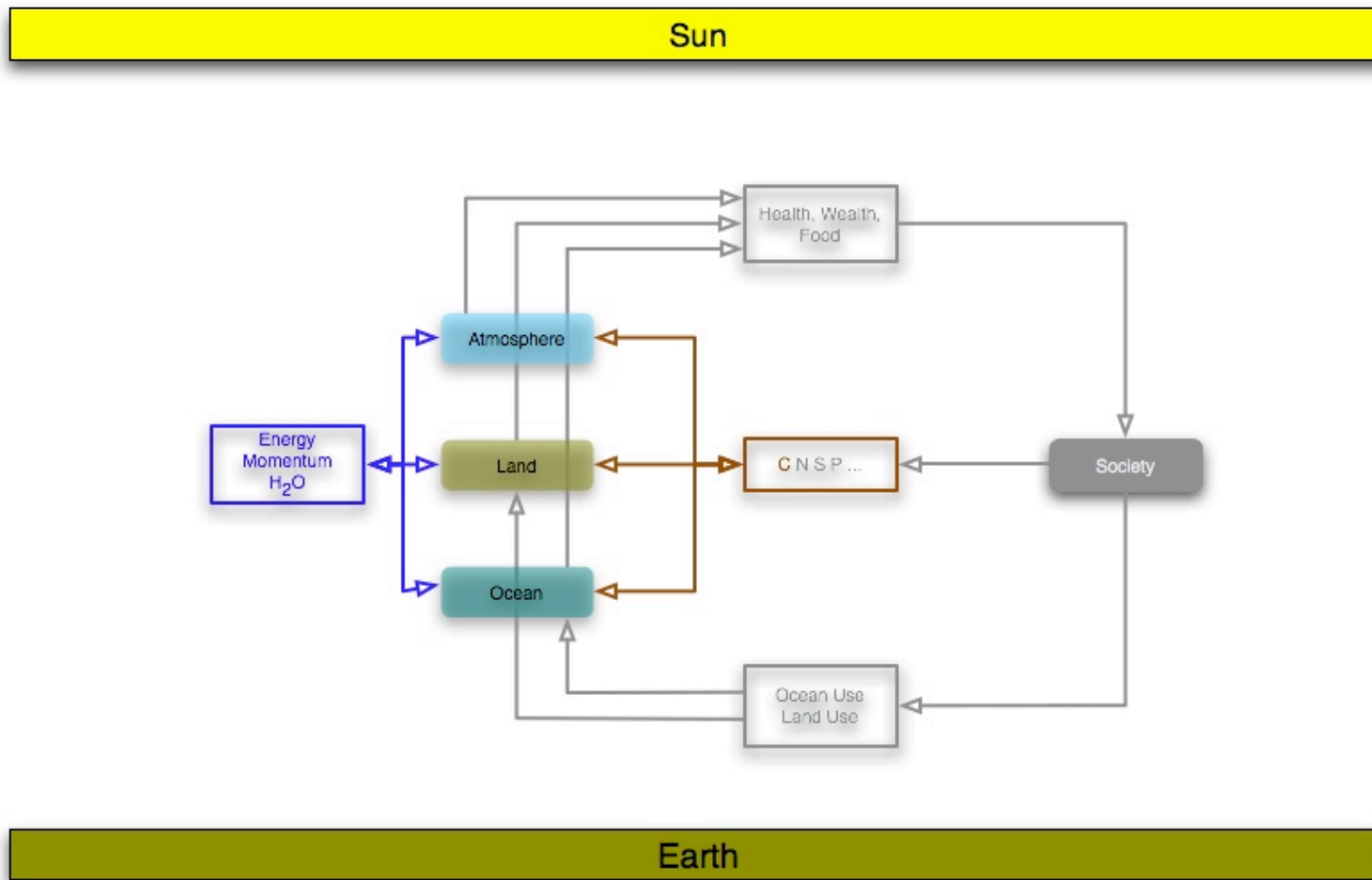
SunEarthSystem and COSMOSvx

cosmos1.0.0.



SunEarthSystem and COSMOSvx

cosmos1.1.0.



SunEarthSystem and COSMOSvx

cosmos1.2.0.

