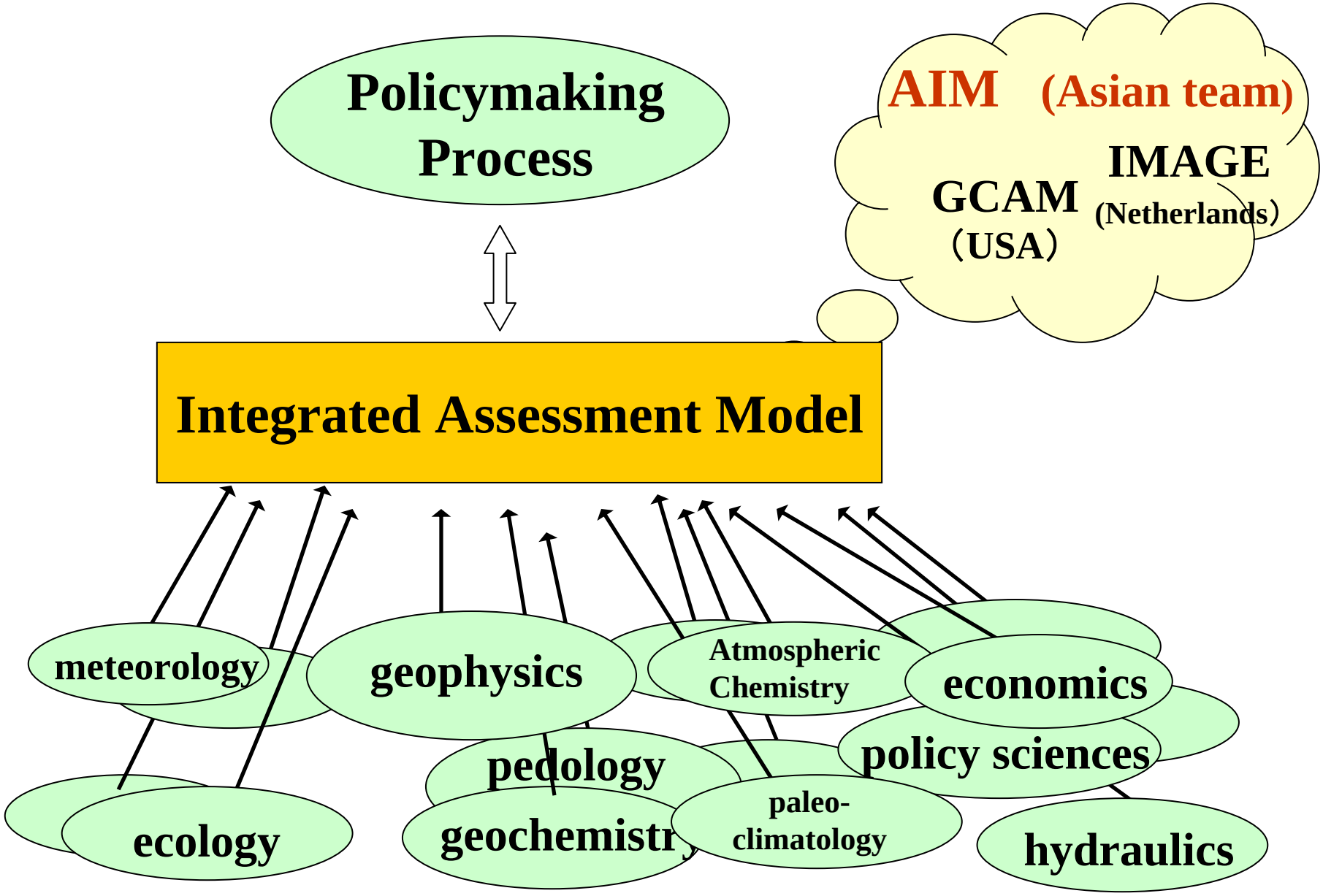
AIM Model Presentation

Hotel Grand Inter-Continental, New Delhi

Yuzuru Matsuoka
Kyoto University, Japan

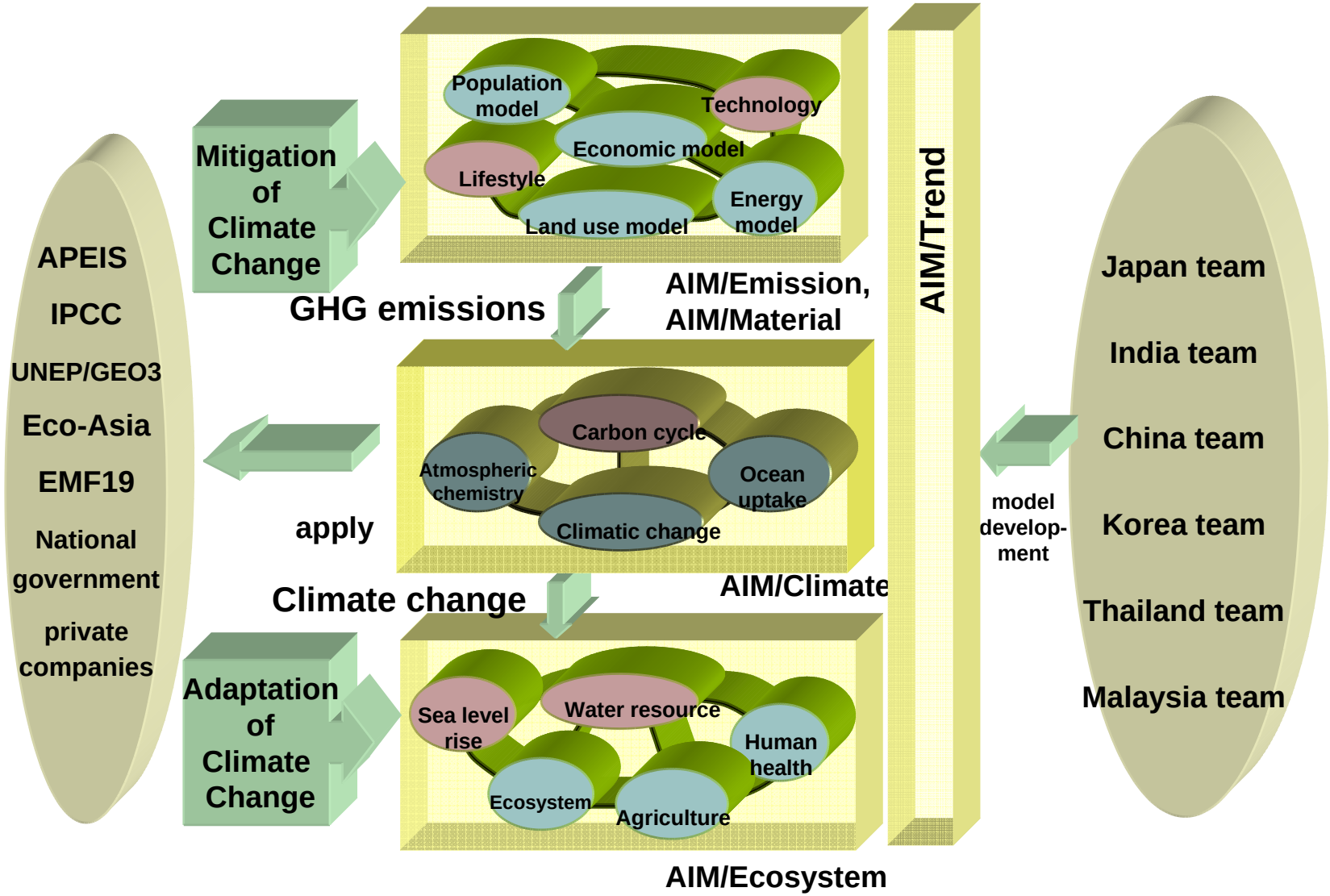
1. **Brief introduction of the AIM**
2. **Projection of Global Warming**
3. **Mitigation of Global Warming**


Policymaking Process
AIM (Asian team)
IMAGE (Netherlands)
GCAM (USA)
Integrated Assessment Model
meteorology
geophysics
Atmospheric Chemistry
economics
policy sciences
pedology
ecology
geochemistry
paleo-climatology
hydraulics

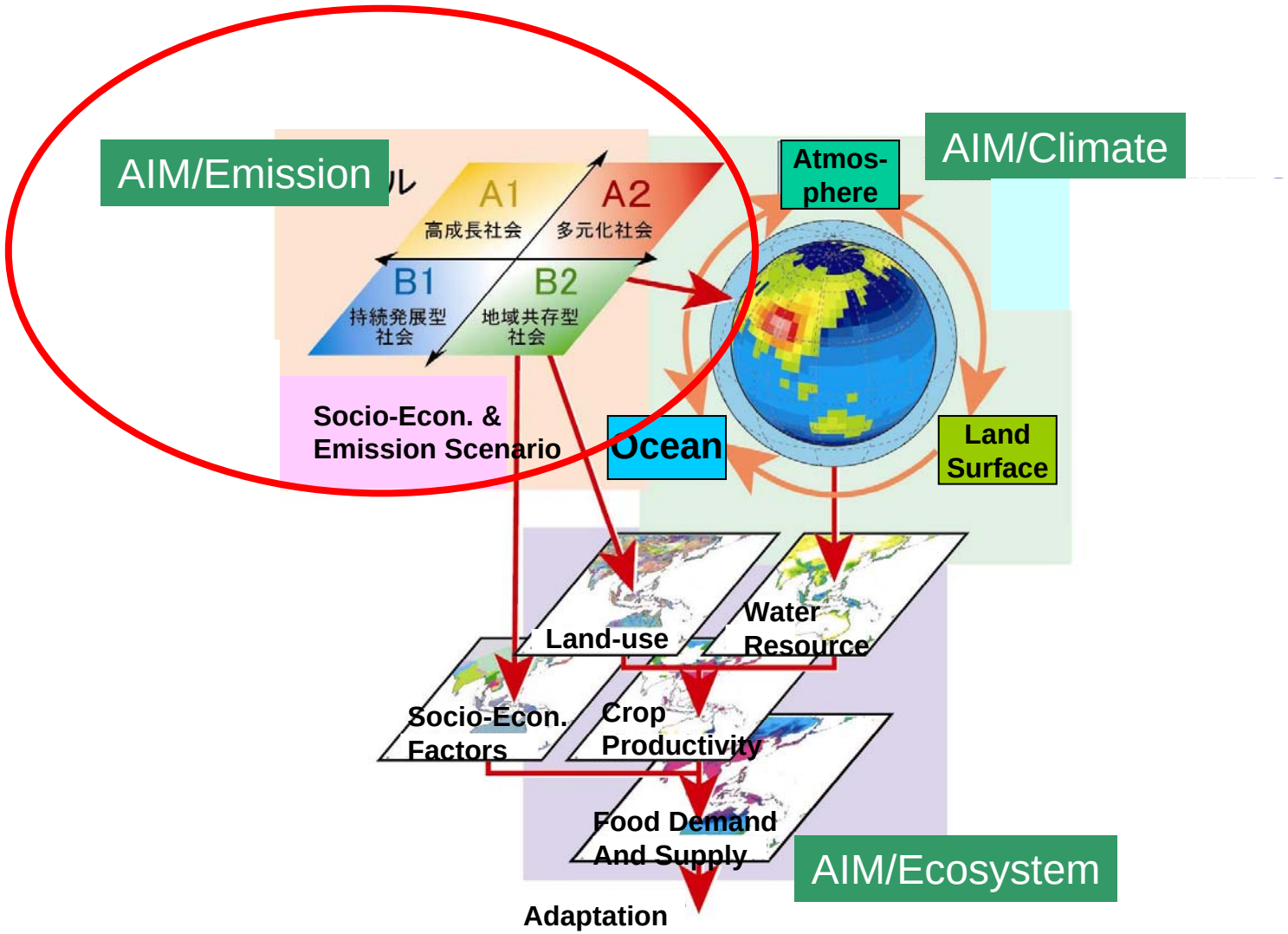
The Asia-Pacific Integrated Model

- **AIM is an abbreviation of Asia-Pacific Integrated Model.**
- **It is one of Integrated Assessment Models (*IAM*), and a large-scale computer simulation model developed to promote the integrated assessment process in the Asia-Pacific region**
- **Collaborated study by Japan, China, India , Korea, Thailand and Malaysia members.**
- **The AIM project is started in July 1990, and began an international collaboration system from 1994.**

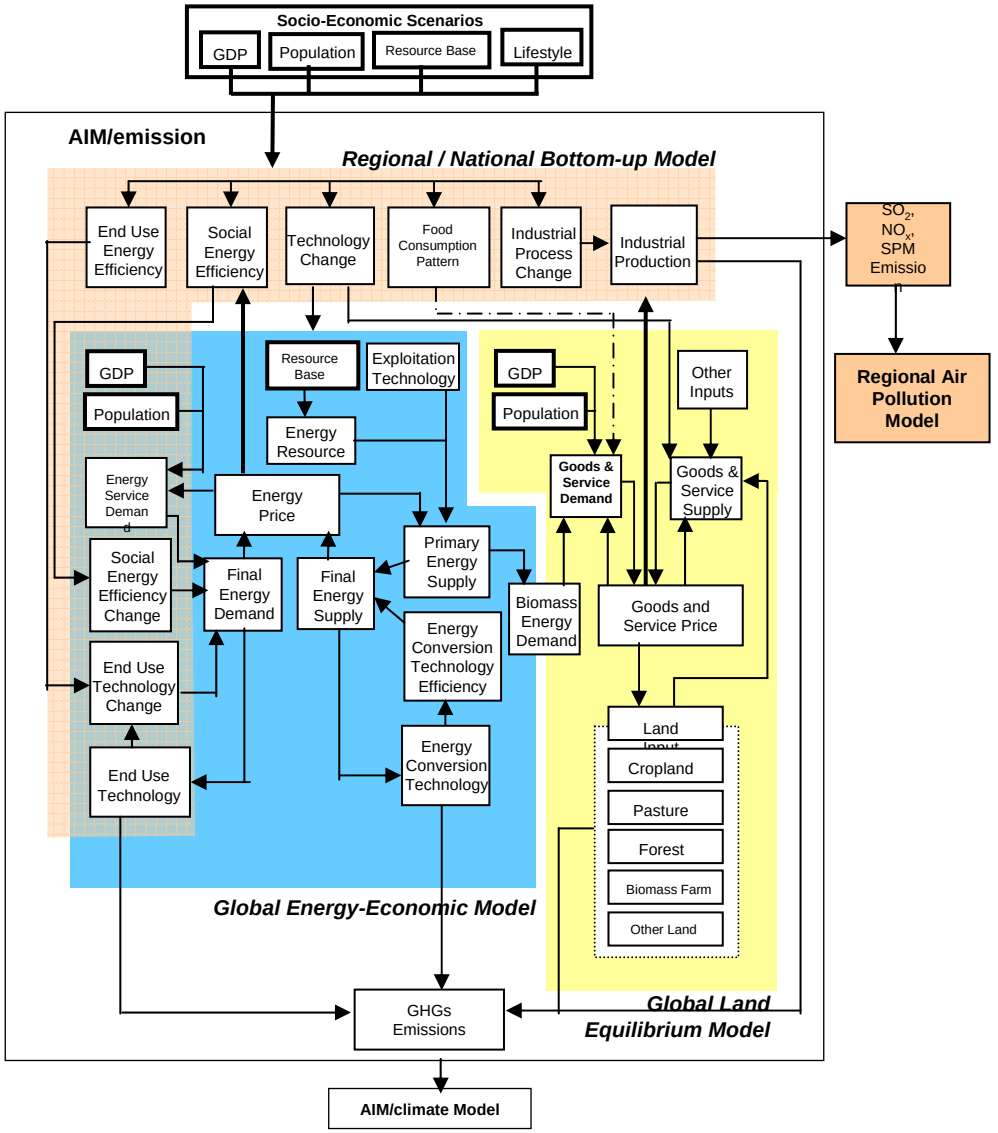
The AIM Approach



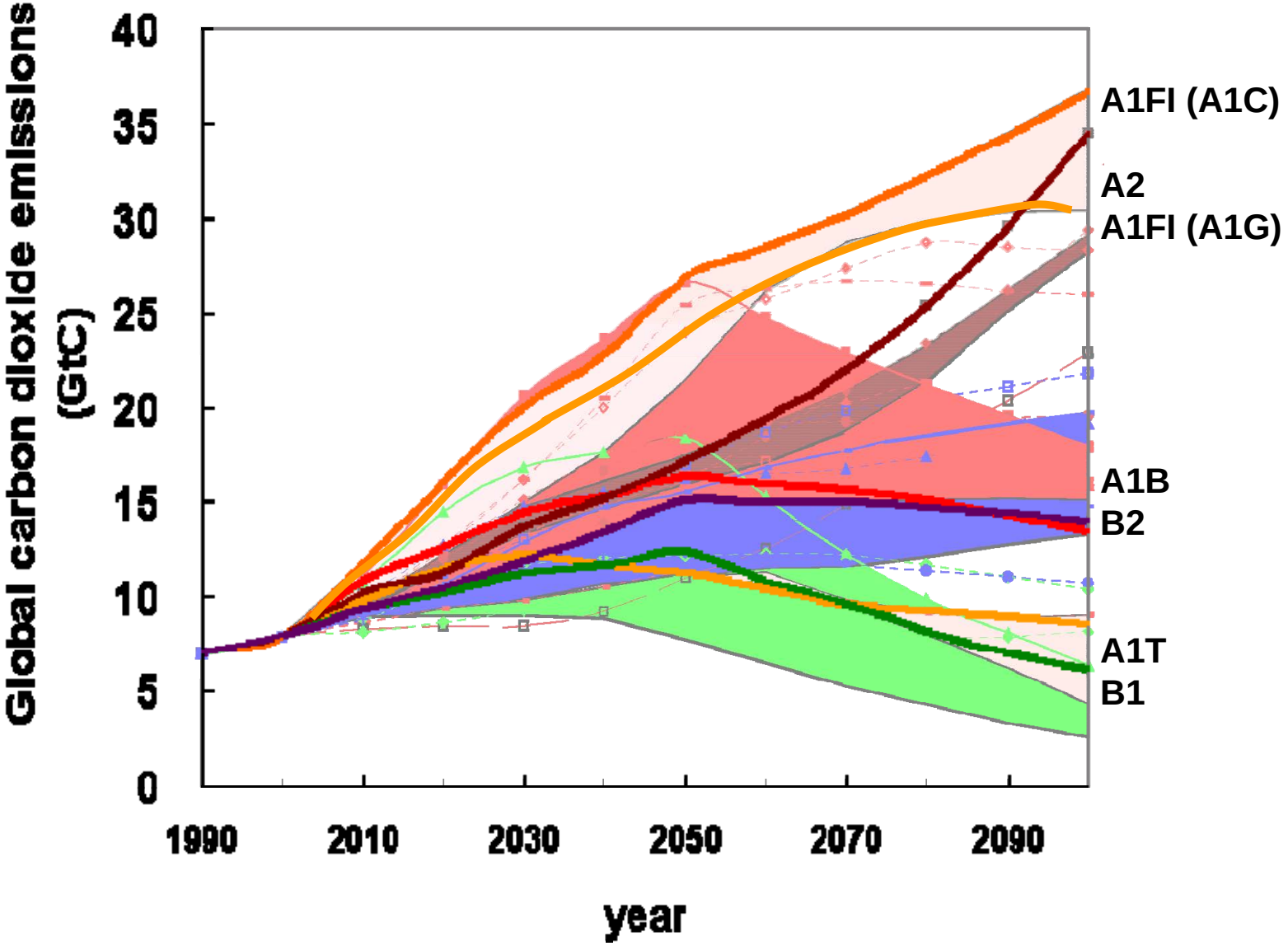
AIM/Emission



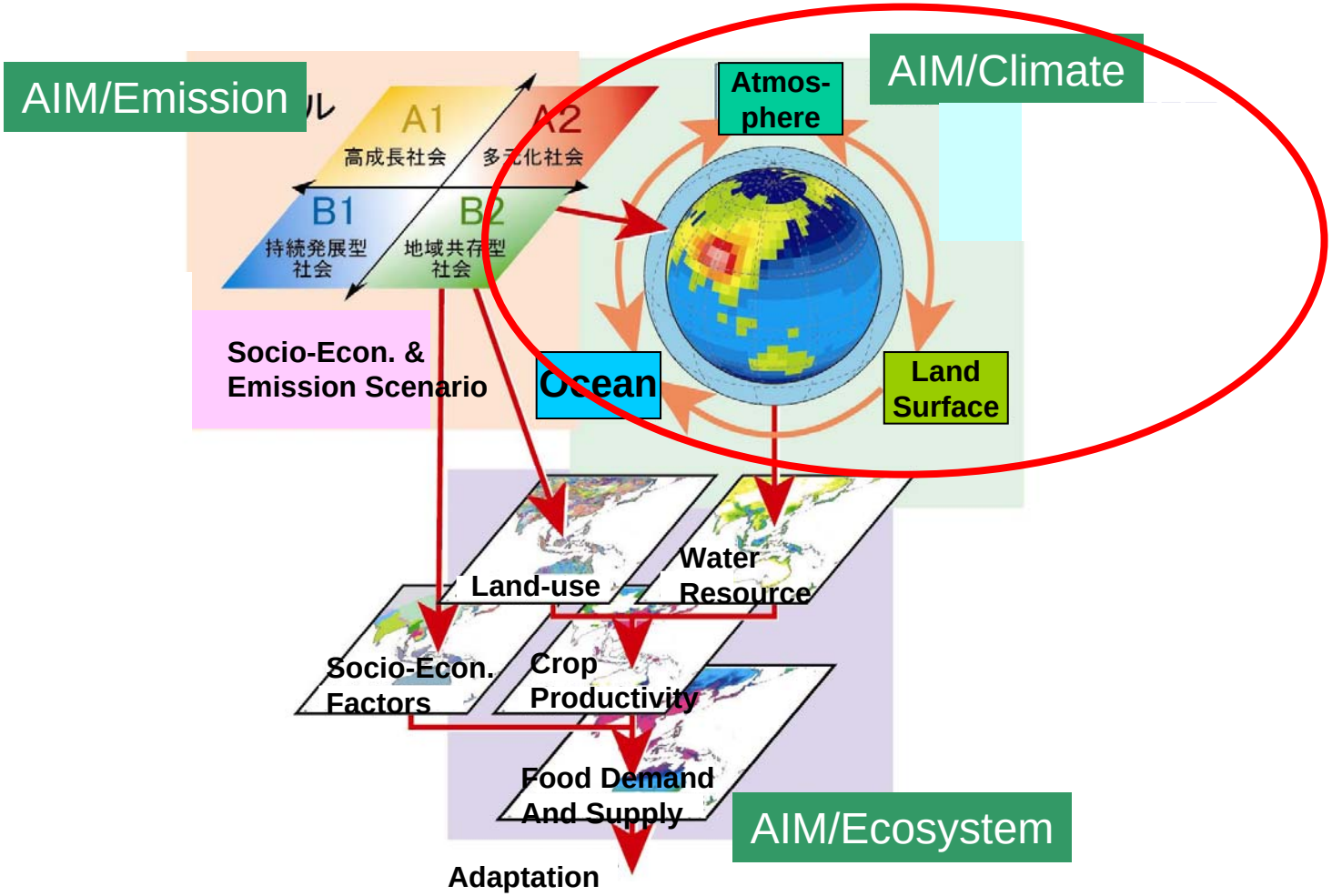
AIM/Emission
Coupling of Top-down model and Bottom-up model



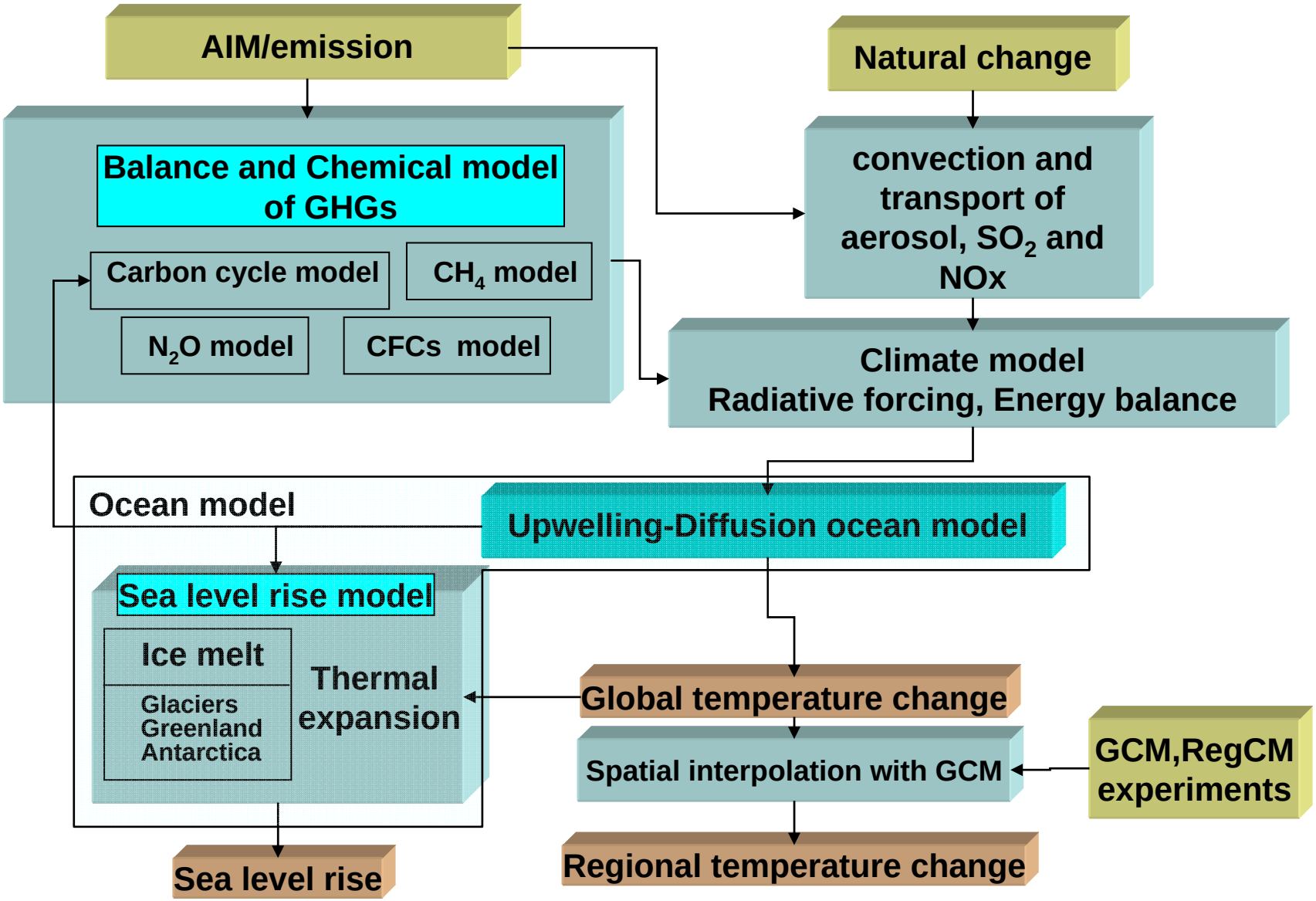
CO_2 Emission Scenarios



AIM/Climate

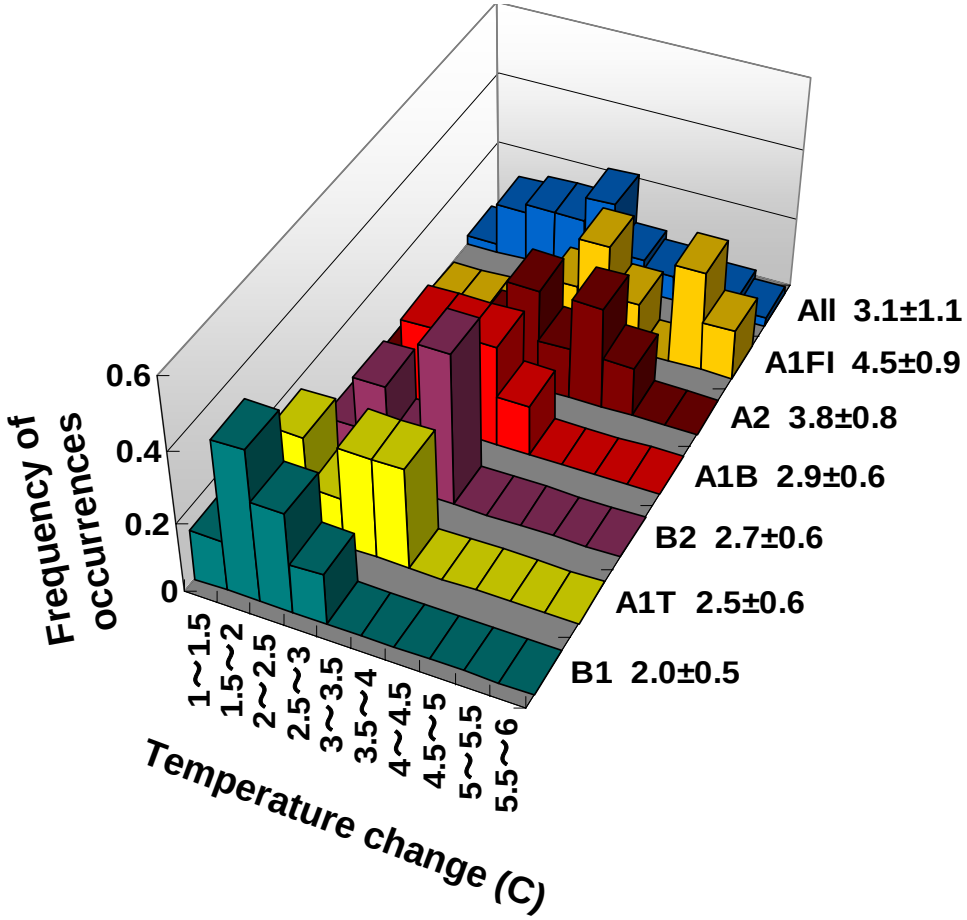

AIM/Emission
A1
高成長社会
A2
多元化社会
B1
持続発展型社会
B2
地域共存型社会
Socio-Econ. & Emission Scenario
AIM/Climate
Atmos-phere
Ocean
Land Surface
Land-use
Water Resource
Socio-Econ. Factors
Crop Productivity
Food Demand And Supply
AIM/Ecosystem
Adaptation

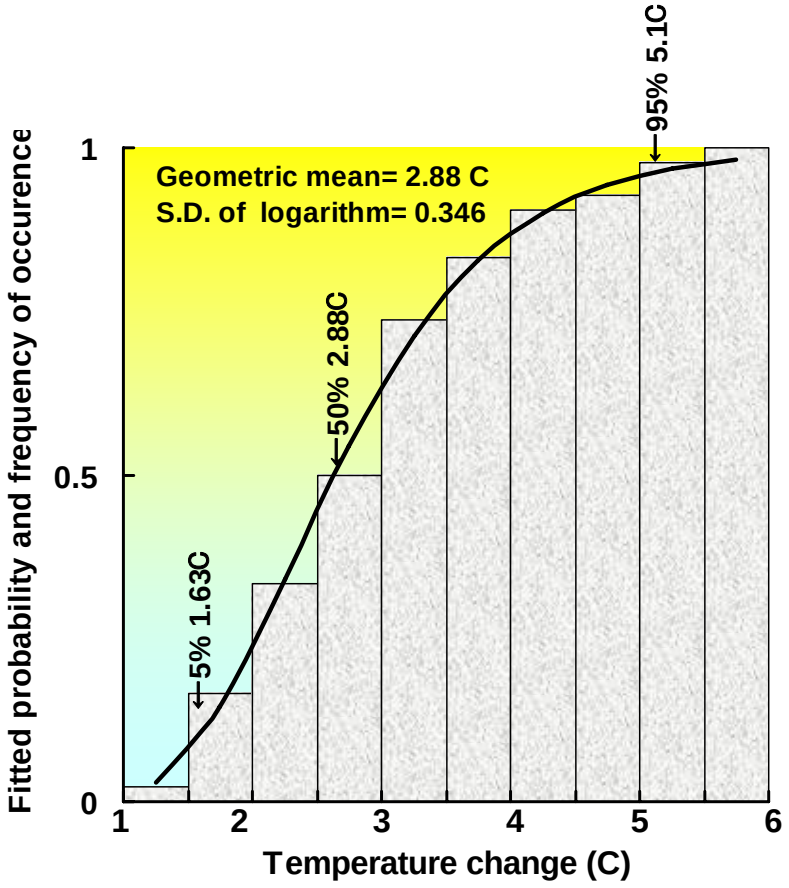
AIM/Climate


AIM/emission
Natural change
Balance and Chemical model of GHGs
Carbon cycle model
CH_4 model
N_2O model
CFCs model
convection and transport of aerosol, SO_2 and NOx
Climate model
Radiative forcing, Energy balance
Ocean model
Upwelling-Diffusion ocean model
Sea level rise model
Ice melt
Glaciers
Greenland
Antarctica
Thermal expansion
Global temperature change
Spatial interpolation with GCM
GCM,RegCM experiments
Sea level rise
Regional temperature change

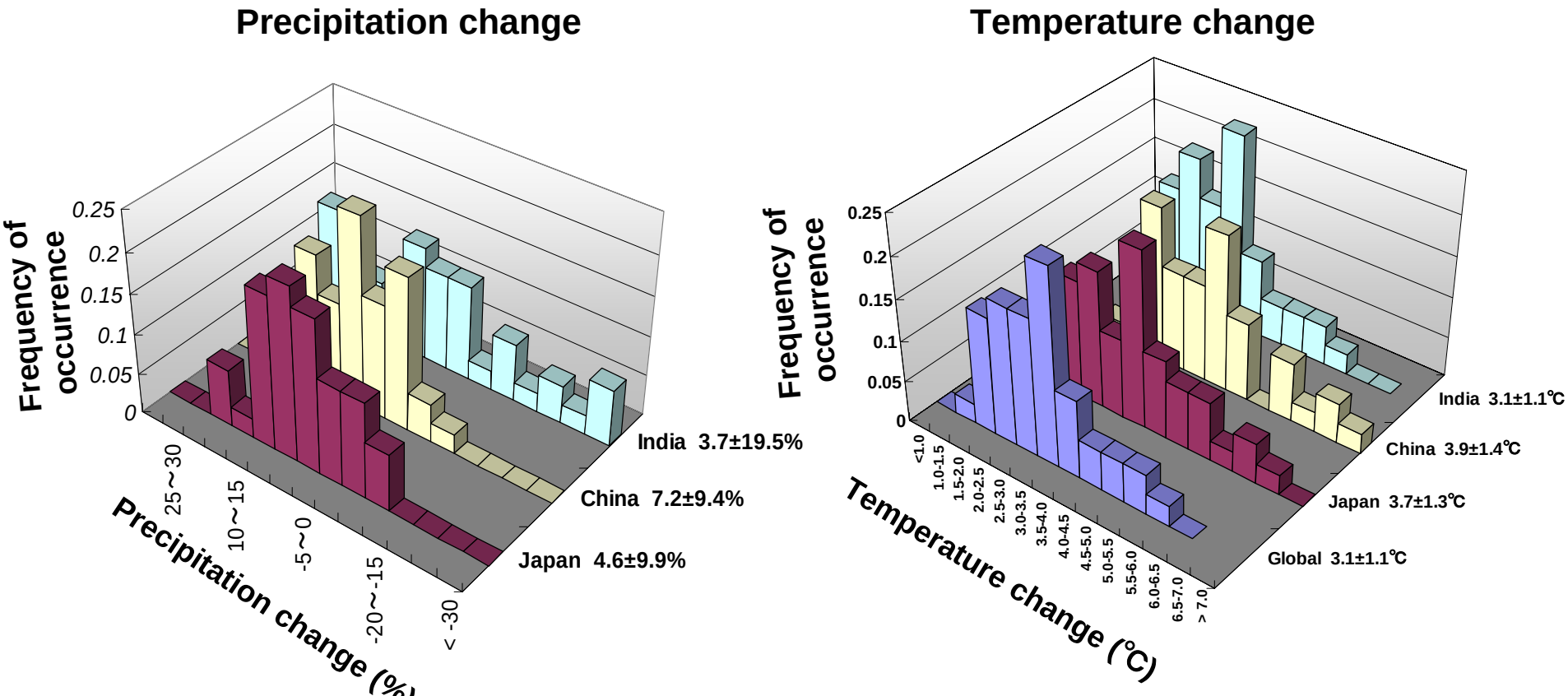
Temperature change between 1990 and 2100

Simulated 7 GCMs are GFDL R15a, CSIRO Mk2, HadCM3, HadCM2, ECHAM4/OPYC, CSM 1.0 and DOE PCM

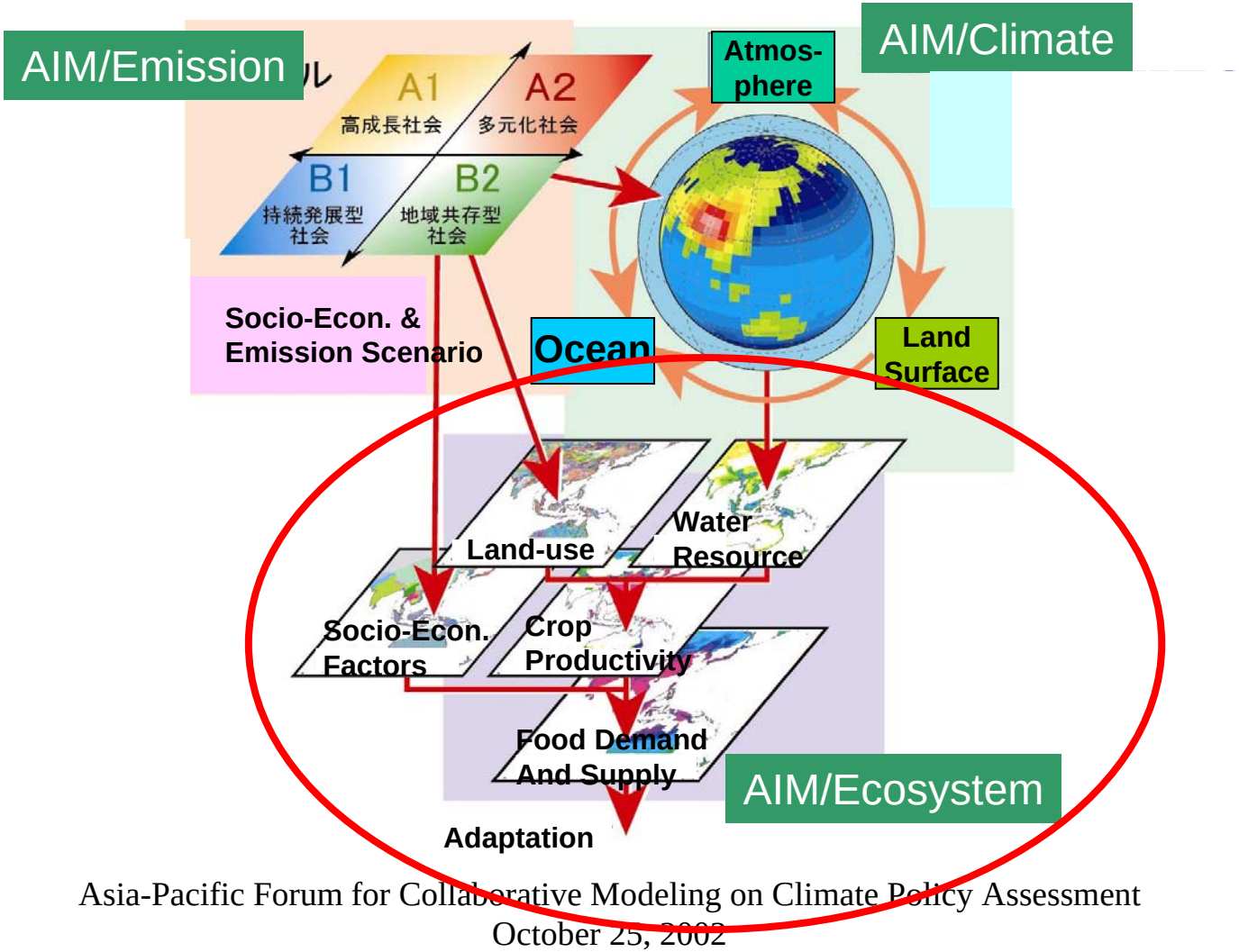




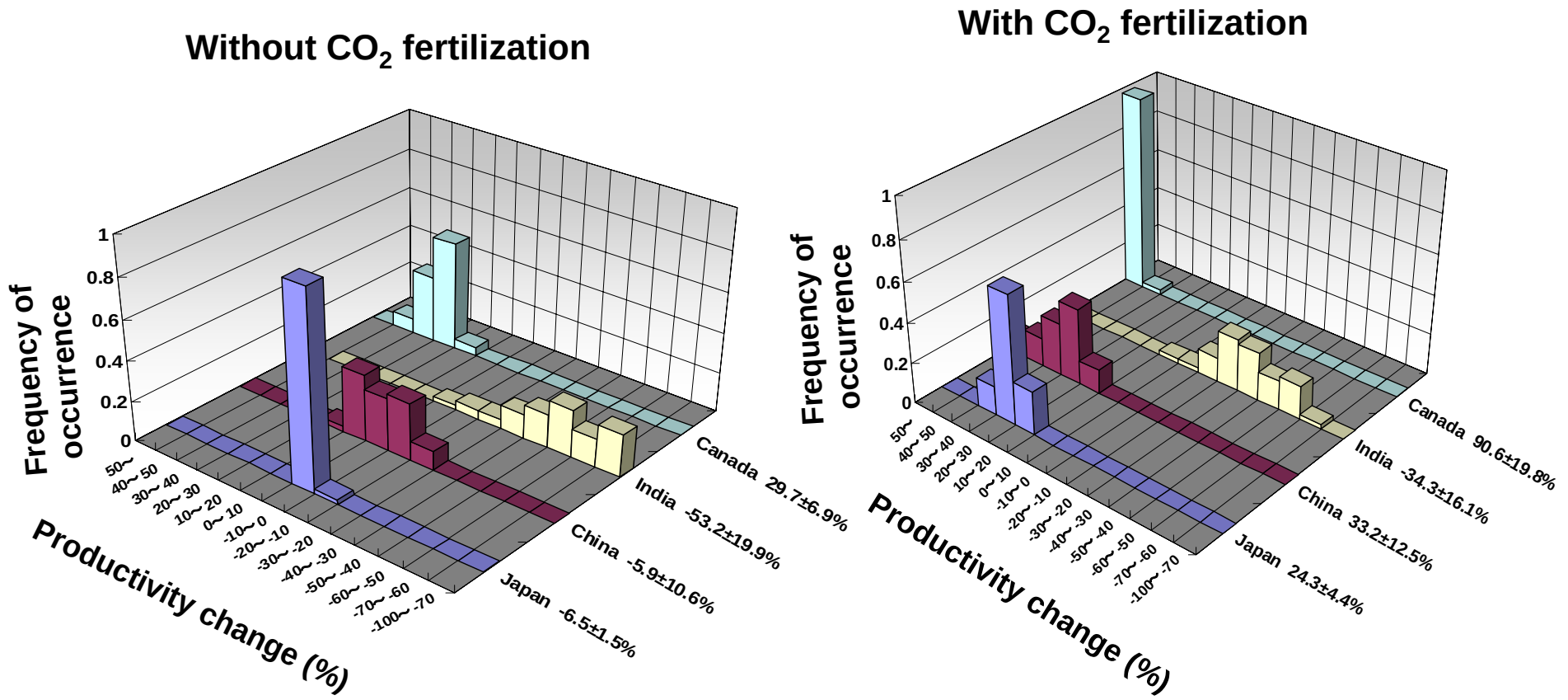
Climate change in Asian-Pacific countries from 1990 to 2100, increase in DJF



AIM/Ecosystem

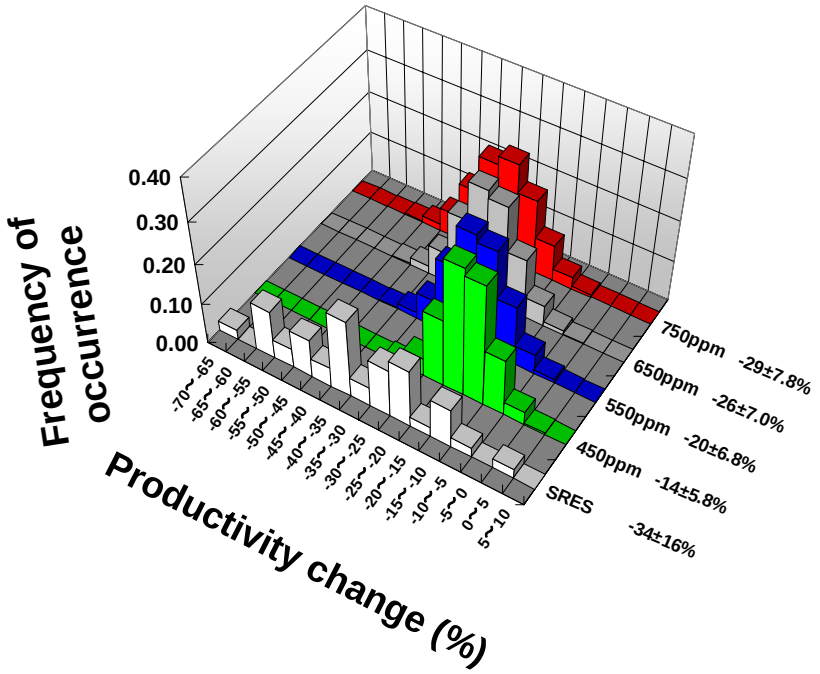


Wheat productivity change in some countries from 1990 to 2100

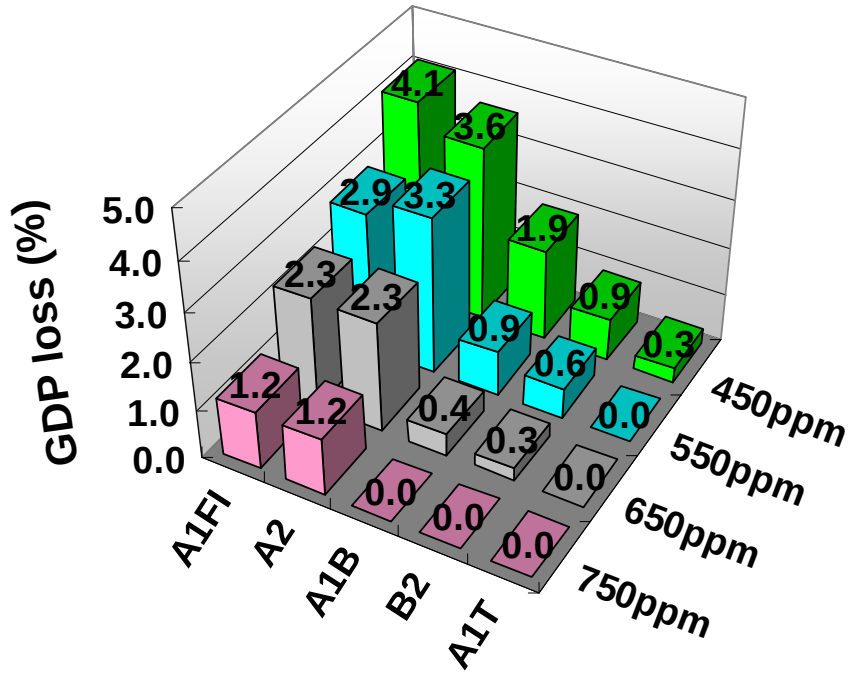


Costs and Benefits Atmospheric Stabilization

Wheat productivity change in India from 1990 to 2100, with CO2 fertilization



GDP reduction relative to SRES scenarios



Some Representative results of AIM calculation

- **Global temperature increases in 2100 are 3.1±1.1℃, lower and upper 5 percentile temperatures are 1.6 and 5.1℃.**
- **Climate change impacts are serious in some sectors and countries.**

  India, wheat productivity, 34±16% and 53±20% decrease w/wo CO_2 fertilization.
- **Some impacts are recovered by these mitigations. In the Indian case, the percentages of recovered are;**

Target concentration	450ppm	550ppm	650ppm	750ppm
% recovered	20%	14%	8%	5%

- **The costs of atmospheric stabilization are in GDP% loss**

Reference Scenario	B2	A2
450ppm target	0.9	3.6
550ppm target	0.6	3.3
650ppm target	0.3	2.3
750ppm target	0.0	1.2