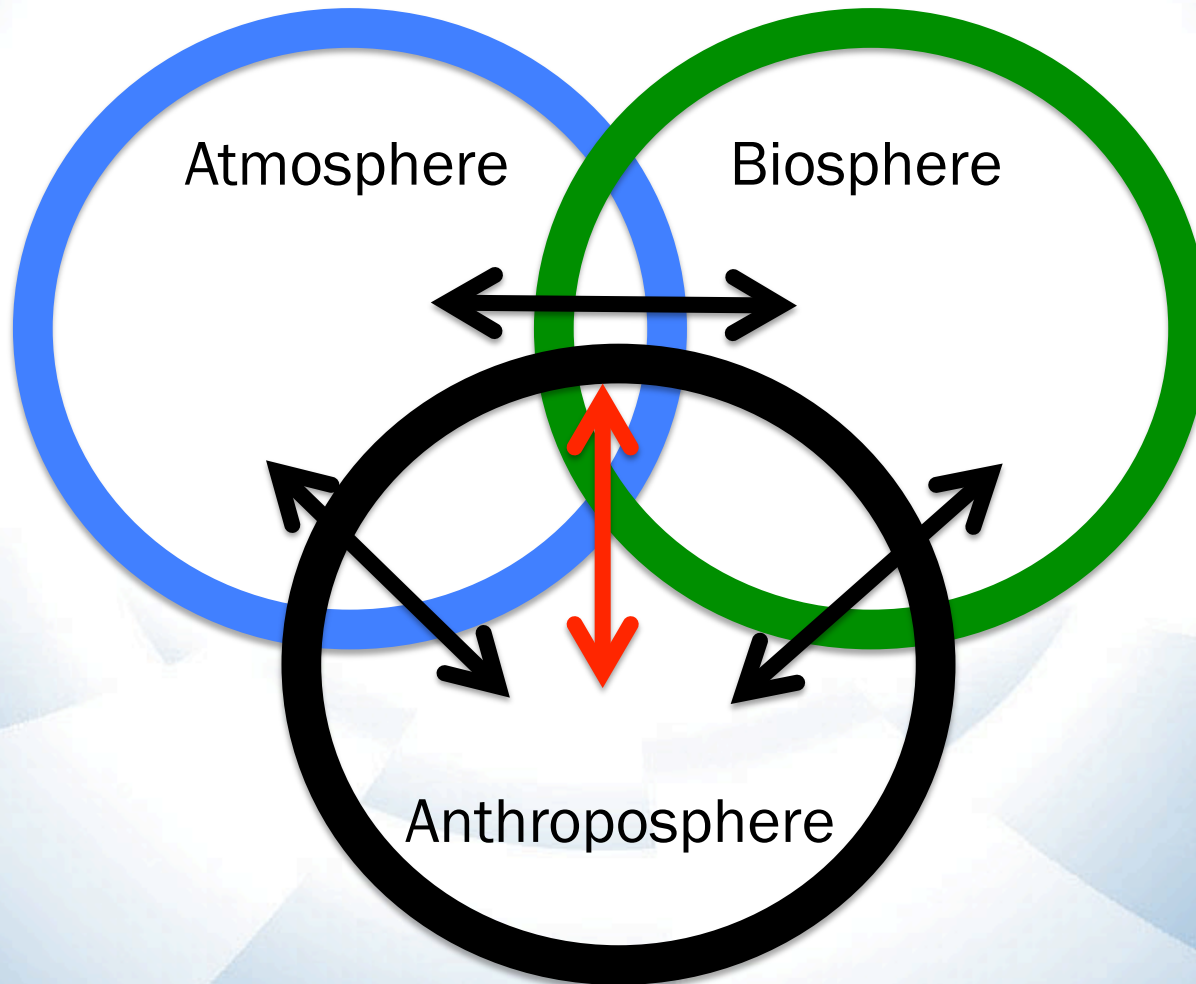


# iLEAPS

## Integrated Land Ecosystem Atmosphere Process Study

Eleanor Blyth  
CEH, UK  
Co-chair iLEAPS

# ILEAPS past and future



iLEAPS focus: basic biogeochemical processes that link land-atmosphere exchange, climate, the water cycle and tropospheric chemistry

# iLEAPS Scientific Steering Committee

1. **Hans-Christen Hansson (Sweden)– co-chair**

2. **Eleanor Blyth (UK) – co-chair**

3. **Hiyama Tetsuya (Japan)**

4. **Sirkku Juhola (Finland)**

5. **Sebastian Leuzinger (CH)**

6. **Meehye Lee (Korea)**

7. **Vinayak Singh (India)**

8. **Sally Archibald (S. Africa)**

9. **Xuemei Wang (China)**

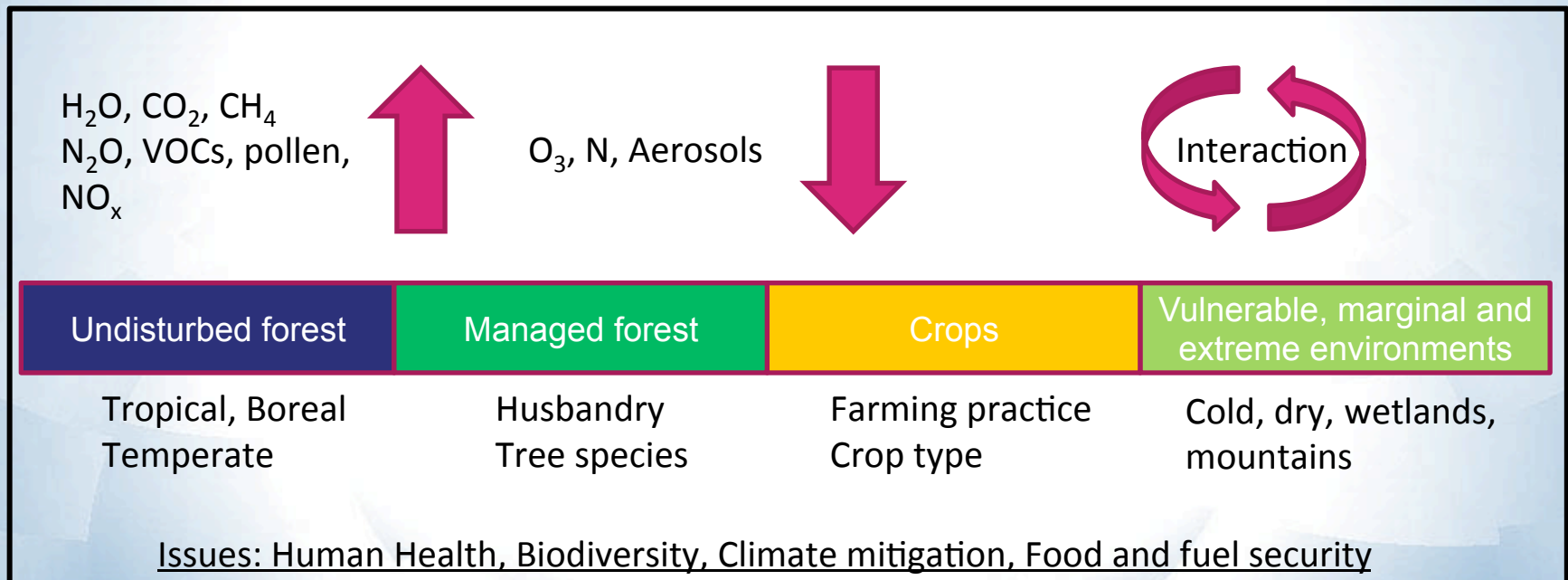
10. **Aijun Ding (China)**

11. **Kathy Galvin (USA)**

12. **Allison Steiner (USA)**

Numira Zhamangulova (Program Officer)

# iLEAPS – integrated Land Ecosystem Atmosphere Processes Study



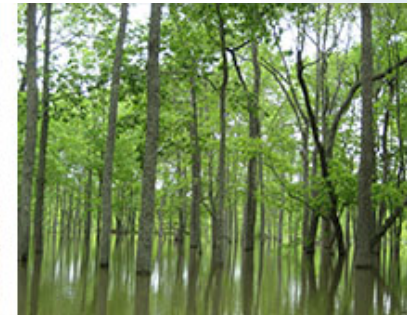
1. How **changing land-use and farming and forestry practice** (irrigation, tillage, fire, draining, fertilisers, grazing, forest husbandry, pest and weed control, choice of crops or trees) affects the **atmospheric chemistry, air quality and climate** ( $N_2O$ ,  $CO_2$ ,  $H_2O$ ,  $CH_4$ , VOCs, pollen etc)
2. How anthropogenic changes in **atmospheric chemistry** ( $CO_2$ ,  $O_3$ ) affects **plant productivity** (ozone damage,  $CO_2$  fertilisation)
3. How **vulnerable and marginal ecosystems** (very cold, very dry) will be affected by **changes in climate** (T,  $H_2O$ ,  $CO_2$ )
4. How **ecosystems** (including fire, wetlands and vegetation) emit **short lived carbon**: e.g. isoprenes and methane as well as carbon dioxide and its impact on the **atmospheric chemistry**

# iLEAPS Initiatives

- E3S = Extreme Events and Environments from climate to Society (Markus Reichstein, MPI-BGC)
- BASI = Biosphere-Atmosphere Society Index (Markus Reichstein, MPI-BGC)
- ACPC = Aerosol Clouds Precipitation and Climate (Daniel Rosenfeld, Hebrew University)
- Earth System Data Cube (CAB-LAB)
- Emission, exchange and Processes of Reactive Compounds (Dan Yakir)
- GEIA (Alex Guenther, UCI)
- CANEX-MIP (Laurens Ganzeveld, Wageningen)
- IBBI



The iLEAPS led project **Extreme Events and Environments from climate to Society (E3S)** is one of the eight newly launched Future Earth initiatives to support global sustainable development. The E3S project is scientifically coordinated and managed in the MPI-BGC (Markus Reichstein).



copyright:  
(top left) Catedral Verde - Floresta Amazonica; (top middle): Craig Allen, USGS, Los Alamos, USA; (top right): U.S. Fish and Wildlife Service;  
(bottom left): Bsam (<http://picsload.com>); (bottom middle left): Jay Janner, The Statesman; (bottom middle right): NATO; (bottom right): Dr. Bernd Gross

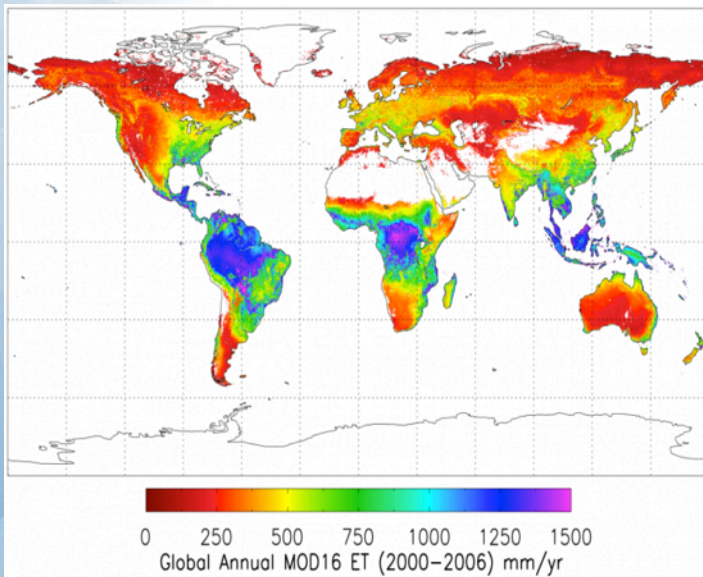
Which are the most relevant metrics for climate extreme impacts on ecosystems and societies?

How do social and natural systems interact at different time-scales?

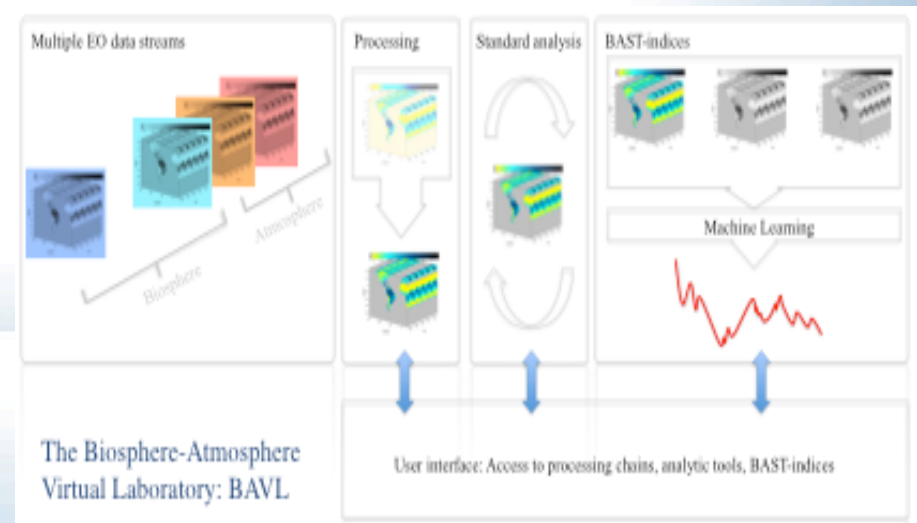
Which system properties yield resistance and resilience to extreme conditions?

# BASI: Biosphere-Atmosphere Society Index

iLEAPS-ESA project: Multivariate analysis of Earth Observations to produce a Biosphere-Atmosphere Index including Fire, Soil water stress, Evapo-transpiration, Photosynthesis, Crop productivity, Land use change



Earth Observation Product

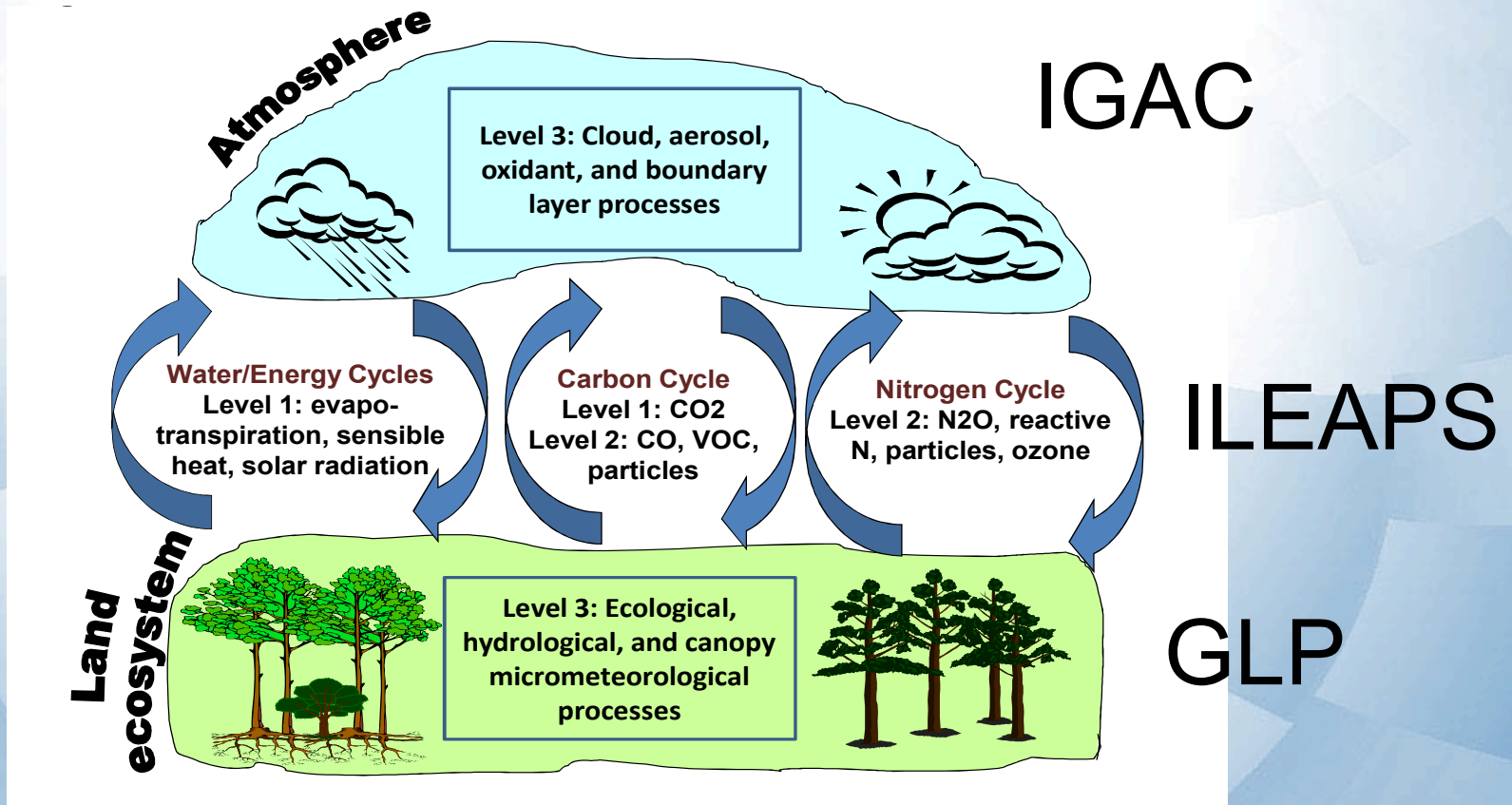


Multi-variate Analysis



Work with other core programmes.  
Promote use of flagship sites, tall towers  
and observational networks

WRCR  
XUMTG



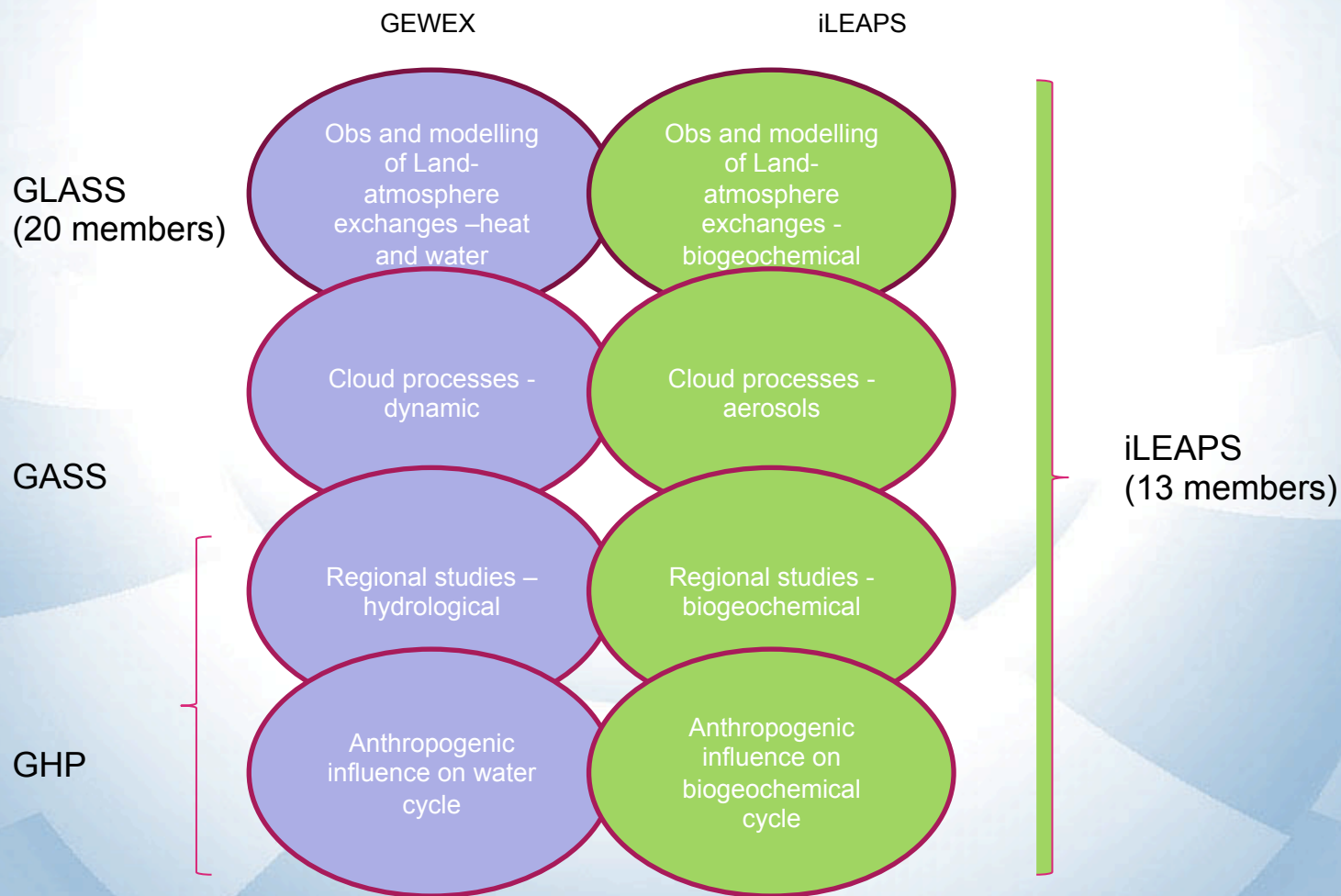
*Schematic of land ecosystem – atmosphere interactions Adopted from Guenther et al. (2011).*



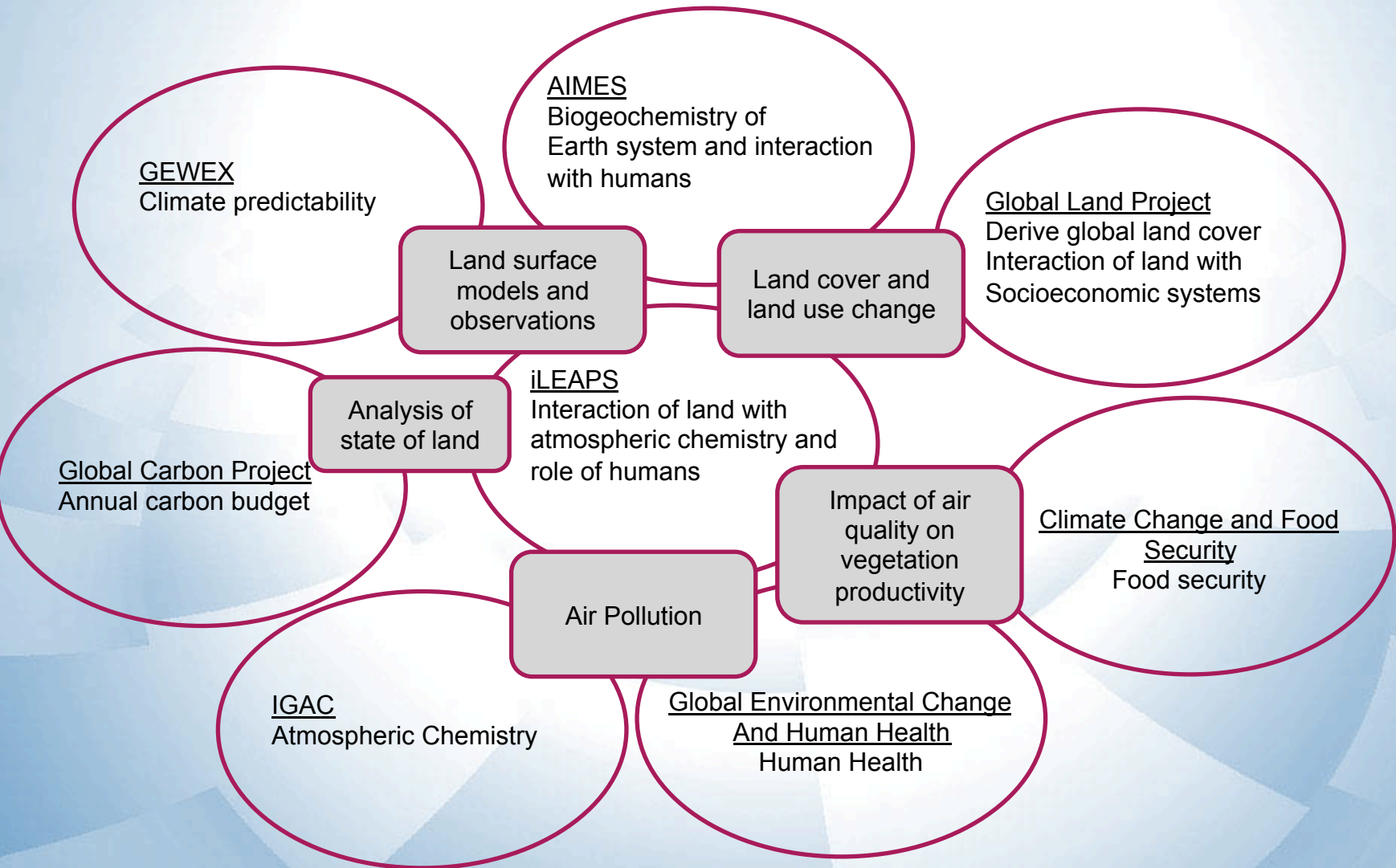
# iLEAPS IPO

- IPO currently in Nanjing, China until end of 2016.  
National committees in China, Korea and Japan
- Moving to European office at end of 2016  
Centre for Ecology and Hydrology (CEH), UK  
Re-design of web page: Summer 2017
- NERC funding application in to support new IPO  
(5-year plan)
- Node for the MENA region at Cyprus Institute  
opening November 2016

## How iLEAPS and GEWEX/GLASS/GHP relate to each other



Joint activities: Benchmarking, support for observations: site based and EO, Land Surface Modelling, freezing and arctic processes, extremes.



# 2017 Science Conference

5<sup>th</sup> iLEAPS open  
science conference

Oxford, UK

11-14 September 2017

Would like to establish  
collaborative sessions  
with other core projects:  
IGAC, Global Carbon  
Project, GEWEX

