SUMMARY

1. Issues tower flux sites can contribute
Regional and global climate changes
Role of the biosphere in the global C cycle
Mitigation of greenhouse effect and the C market
Ecosystem and climate models, Interdisciplinary scientific projects
2. Measuring surface exchanges: the eddy covariance method
Surface balance (radiation, water, energy)
The eddy covariance method
3. Instrumentation
4. Estimating ecosystem fluxes
The concept of fetch, Spectral relationships, Averaging options
Webb correction, Energy closure
Diel and seasonal variability
Biometric stock changes
5. Monitoring sites over tropical ecosystems
Tropical forest
Savanna
Agrosystem (sugar cane)

Participation in interdisciplinary scientific projects

The Large Scale Biosphere-Atmosphere Experiment in Amazonia (LBA)

The Large Scale Biosphere-Atmosphere Experiment in Amazonia

D638.00.JD11

Universidade de São Paulo
BRASIL

Coordination: Instituto Nacional de Pesquisas Espaciais (INPE)

232 instiutions

50 brazillians

182 foreign (mostly USA and UE)

973 researchers

380 brazillians

593 foreign

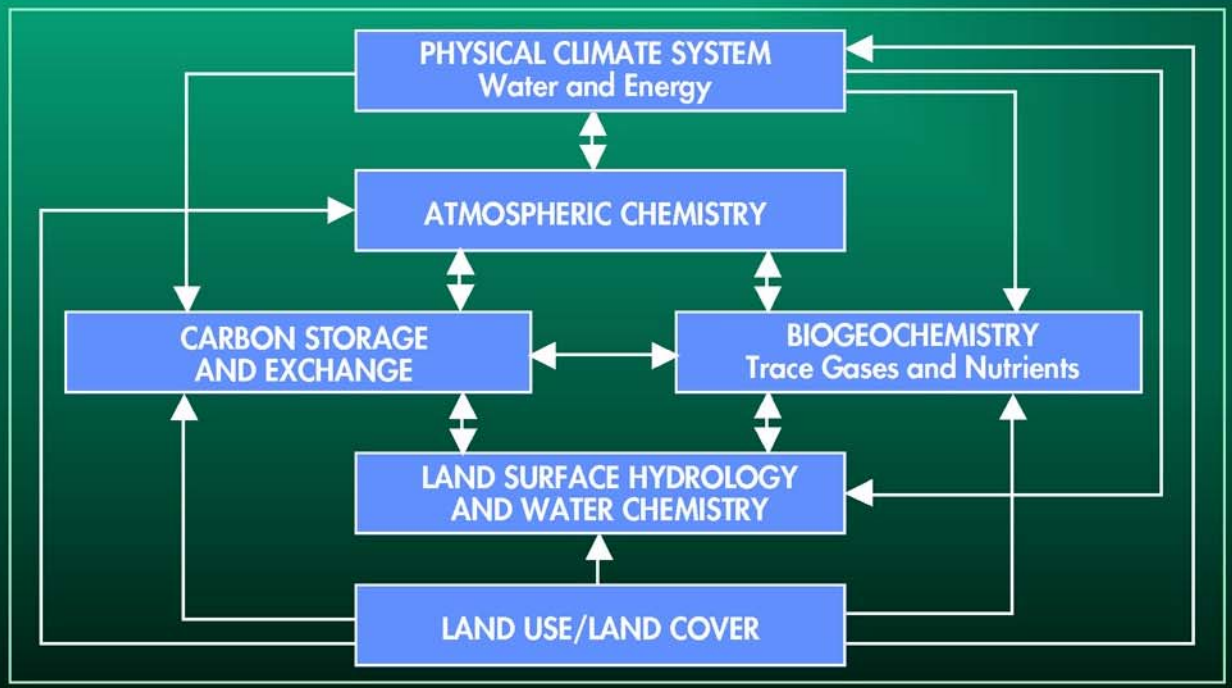
The Two Fundamental Scientific Questions of LBA Are:

- How does Amazonia currently function as a regional entity?
- How will changes in land use and climate affect the biological, chemical and physical functions of Amazonia, including the sustainability of development in the region and the influence of Amazonia on global climate?

The vast size of Amazonia and its position in the humid equatorial tropics give the region a potential for influencing global energy, water, carbon and trace gas budgets which we cannot afford to neglect in the search for understanding of how climate may change in the future.

Research Strategy

LBA integrates multi-disciplinary studies from the earth, life and human sciences, which meet not only their specific objectives but also contribute to the common LBA goals. By linking these individual, focused efforts the LBA approach ensures the transfer of experience, ideas and data across disciplinary boundaries.

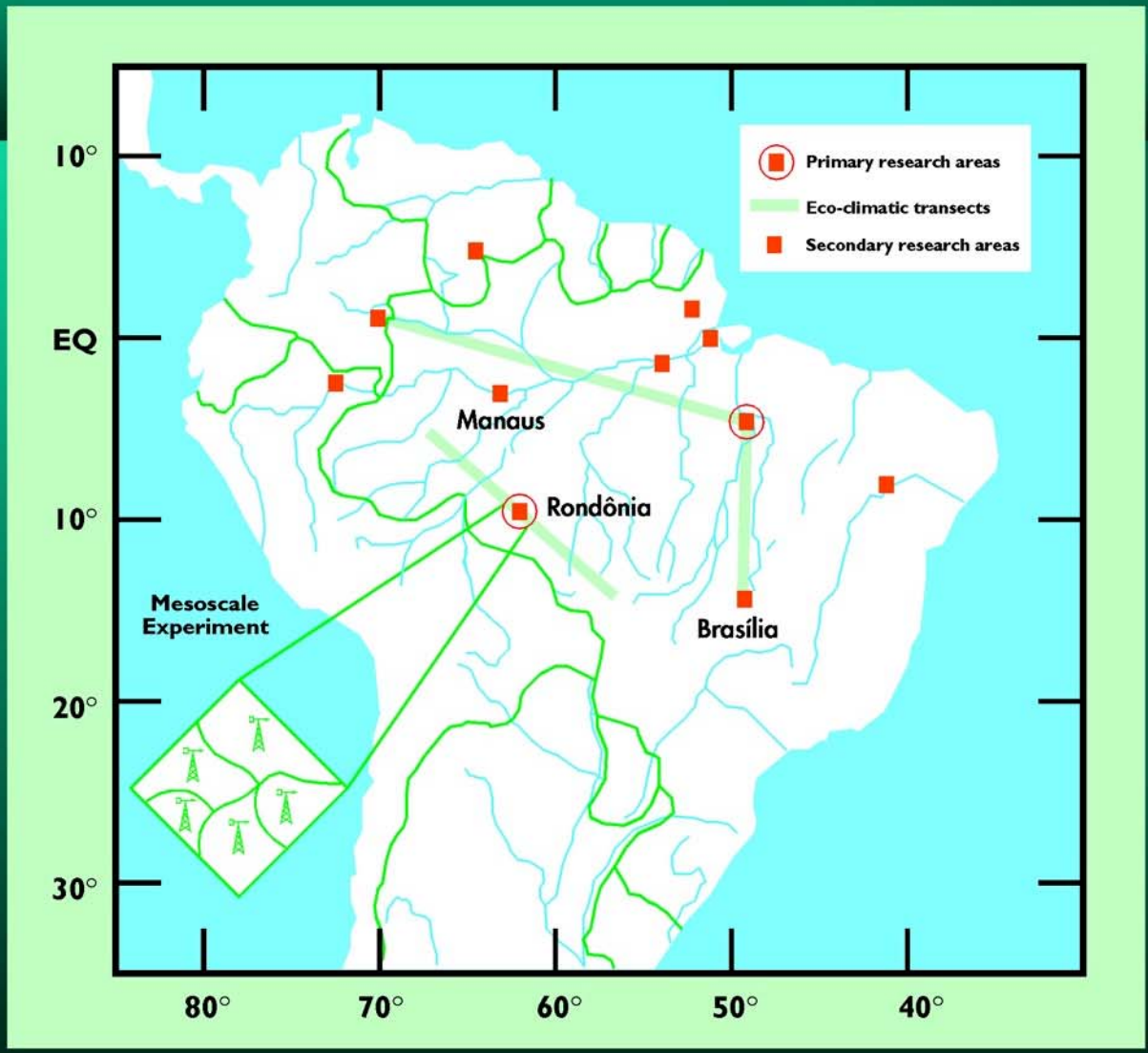


LBA research will be scientifically organized into six themes:

- Physical Climate
- Carbon Storage and Exchange
- Biogeochemistry
- Atmospheric Chemistry
- Land Surface Hydrology and Water Chemistry
- Land Use and Land Cover Change

The LBA Scaling Strategy

Although the LBA scaling strategy builds partly on the methodology developed in previous land surface experiments, unlike these, LBA is concerned with the fate of the entire ecosystem. This is reflected in the time-scale of LBA field activities, which includes multi-year monitoring of environmental characteristics.



A schematic map showing the research areas of LBA. Primary research areas will be part of the two eco-physiological and land use transects. Secondary research areas will be established over the entire Amazon basin.

The Big Carbon Questions

natural disturbance: volcanic eruption

anthropogenic disturbance: burning oil fields

- How will changes in land use affect the net carbon balance between terrestrial ecosystems and the atmosphere, and do undisturbed forest ecosystems function as net carbon sinks?
- What are the sizes of the carbon pools in the vegetation and soils of intact, secondary and selectively-logged forests, savannas, and agricultural lands? What are the net rates of carbon exchange between the atmosphere, vegetation and soil, and how are the sizes of the pools and the rates of exchange altered by natural and human disturbances?

Flux towers

Bragança	mangroove
Brasília	savanna
Brasília	savanna
Caxiuanã	forest
Ilha do Bananal	flooded savanna
Ji-Paraná	transition forest
Manaus (K34)	forest
Manaus (K14)	forest
Ouro Preto d'Oeste	pasturand
Santarém (Flona km 67)	forest
Santarém (Flona km 77)	pasture / crop
Santarém (Flona km 83)	forest & logging
Sinop	savanna

(Santarém,PA, km83)

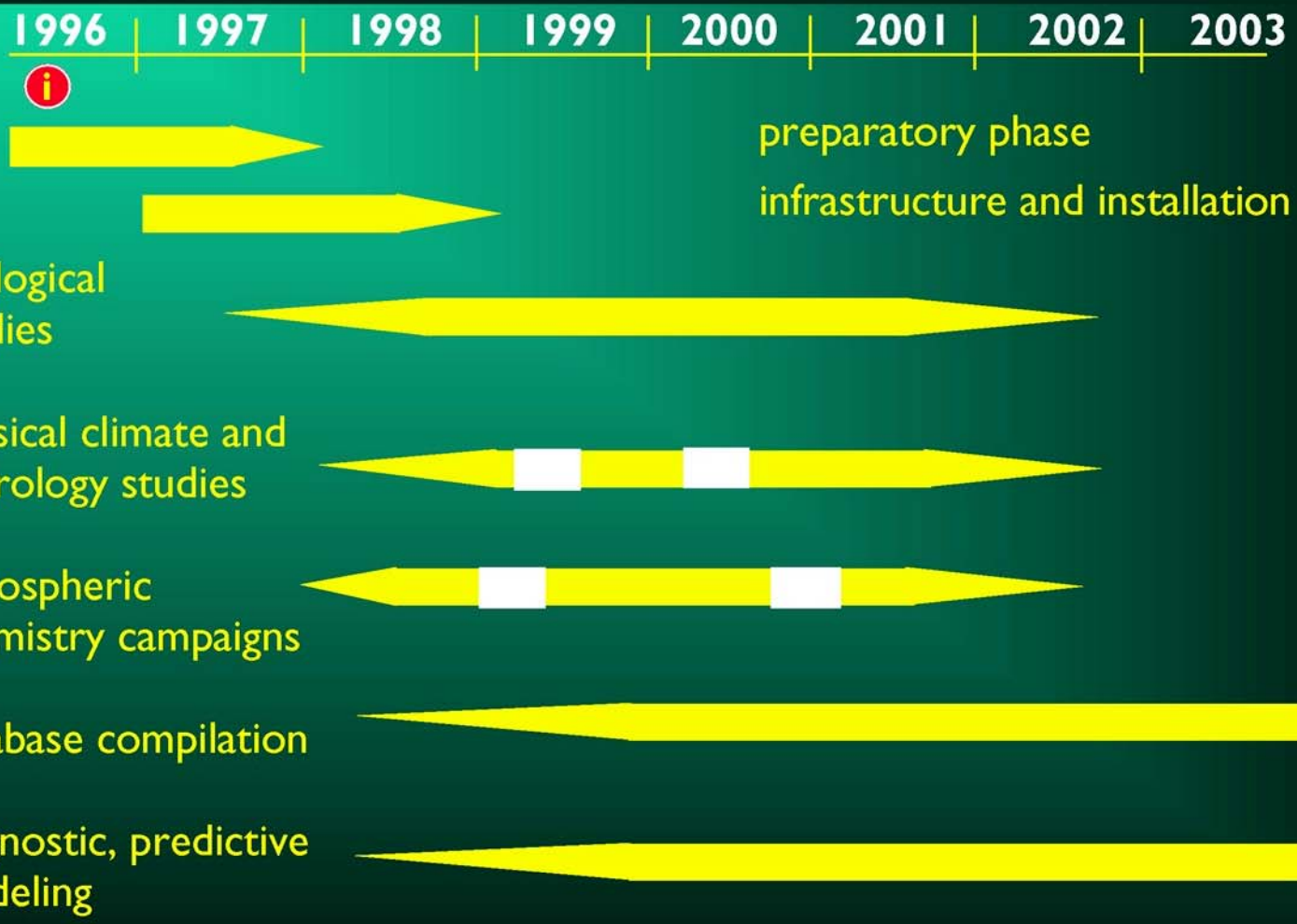
Universidade de São Paulo
BRASIL

FLUXNET

A Global Network

USP Universidade de São Paulo
BRASIL

Chronogram for LBA



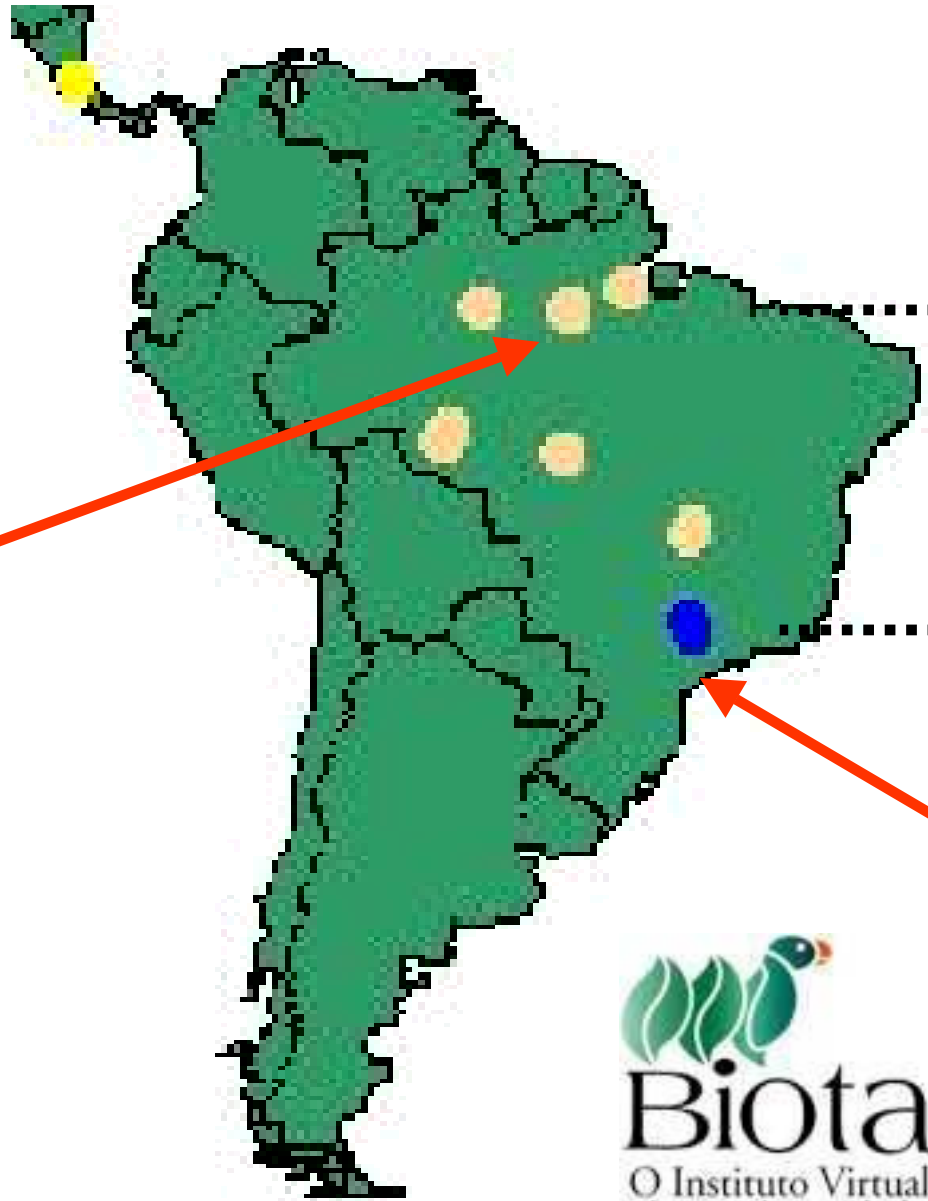
Programa Biota Fapesp

Caracterização, conservação e sustentabilidade da biodiversidade no estado de São Paulo.

Coordenação: Carlos Joly (Unicamp)

39 projetos (to 2002)

700 participantes (técnicos, alunos, pesquisadores)



3º S

21º S

Tropical forest

Pará state

Cerrado Restrito (savanna) and Sugar Cane

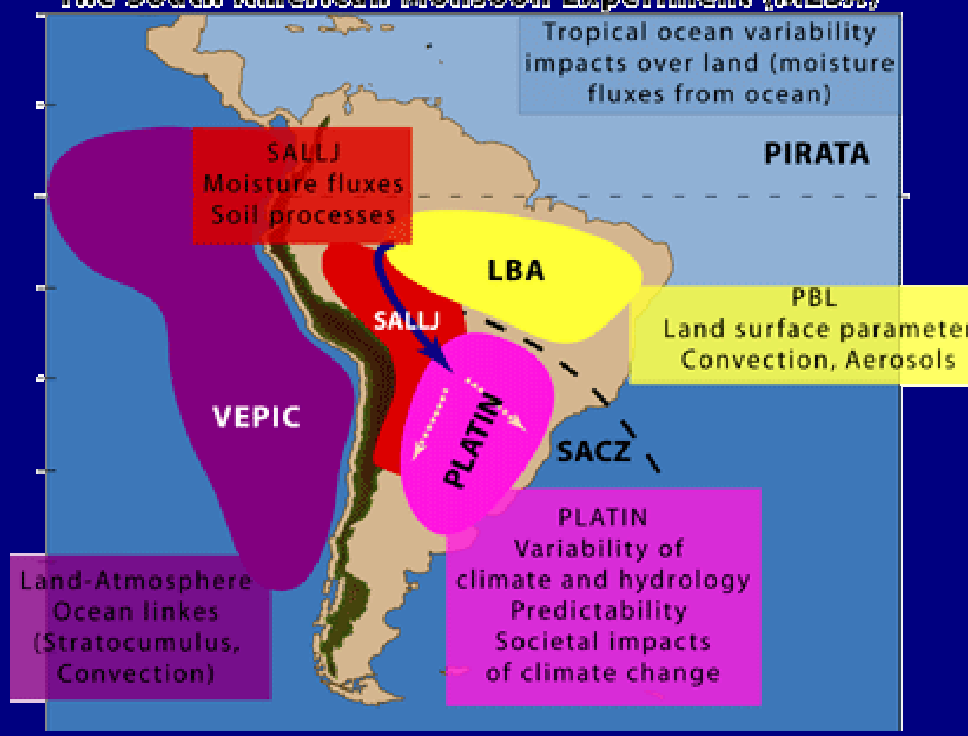
São Paulo state

Biota
O Instituto Virtual da Biodiversidade
FAPESP

USP Universidade de São Paulo
BRASIL

Programa La Plata Basin

Gewex



Predictability of weather, climate and hydrology over the La Plata River basin

Coordination: Dr. Carlos Mechoso (UCLA)

Predictability studies with Numerical Models *1 Climate and weather prediction*
2 Hydrology

Sensitivity to Climate Change

Environmental Issues
1 Land-cover change, deforestation and agricultural production
2 Increased urbanization: Natural hazards and vulnerability
3 Critical regions for sustainable development

Application of Climate Forecasts: Case Studies
1 Application of Climate Forecasts to Water Resource Management: a case study of Itaipu
2 Application of Climate Forecasts to Agriculture: a case study of Uruguay
3 Application of Climate Forecasts to Urbanization: a case study of Buenos Aires