PASCAL

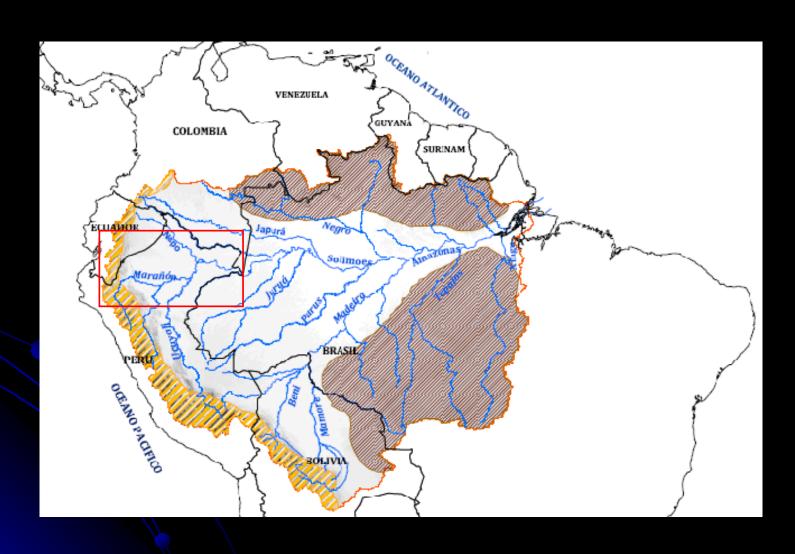
PASt climate change impacts on Carbon Accumulation in Amazonia flood plain Lakes

Objectives:

- Evaluated how much climate changes may have influenced erosion and deposition of sediment and sedimentary organic carbon in Amazonian floodplains.
- What is the influence of decennial to centennial climate variability in modern and past data?
- What is the importance of carbon sequestration by sedimentary processes in relation to the whole cycle of carbon in Amazonia?

Study area:

Peruvian Amazonia



Equipes:

LMTG

LOCEAN

EPOC

Colaborações:

UFF

USP

UEA

Two approaches to reconstructe paleoclimate and paleohydrology

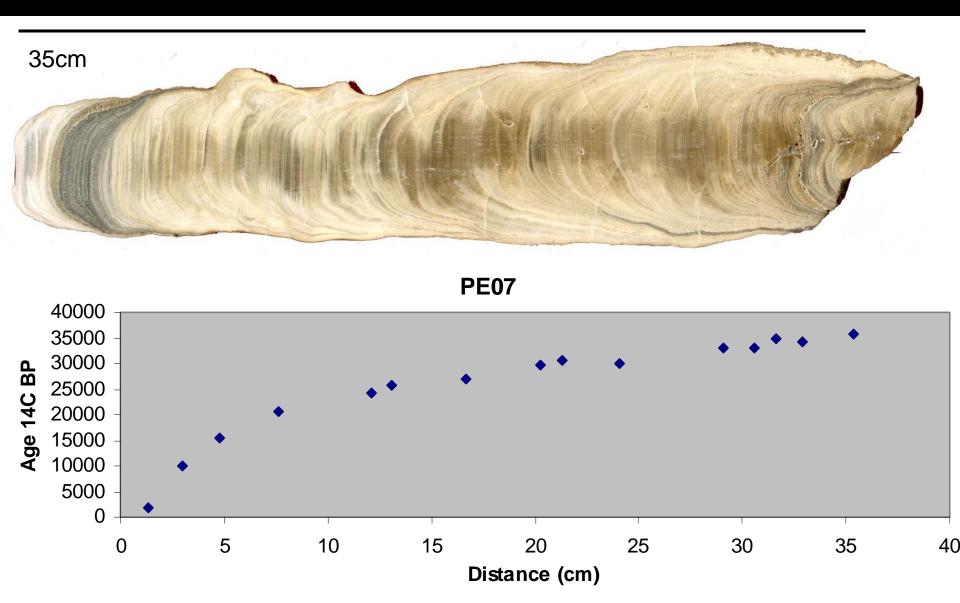
- Speleothemes
- Laminated sediment cores

Two time scales

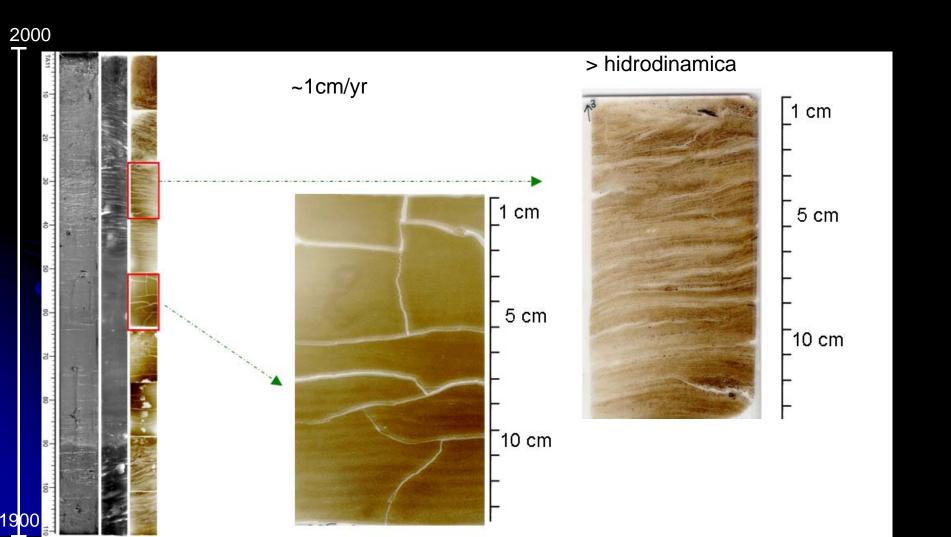
The last 25 000 years (Last Glacial Maximum, Younger Dryas, deglaciation phases and a full Milancovitch cycle of precession).

The last centuries (interannual variability: El Nino, La Nina and interdecadal variability)

-to reconstruct the climate in the past 25,000 yr in Andean Amazonia, using speleothems signatures from Ecuadorian, Peruvian and Bolivian caves



-to determine the paleohydrological variations in the Peruvian Amazon Basin at two time-scale: during the last 25000 yr and the last centuries using high resolution studies of lacustrine records



-to calibrate, through the study of modern data the influence of climate variability on water and sediment discharge

ORE Hybam MES data Remote sensing

-to determine deposition and erosion rates in alluvial plains during the past 25,000yr and to compare with modern rates (from Peruvian and Brazilian Amazon floodplain cores)





- to determine the accumulation rates of organic carbon
- -to identify the main climatic factors (extreme events, short term variability) responsible for erosion/deposition processes

Expected results of PASCAL project are:

- Dated speleothem records of geochemical paleoclimate proxies (time series).
- Statistical relationships between modern climate and hydrology variabilities.
- Quantification of present-day sediment transport through field data and satellite imaging
- 3D reconstructions of floodplains deposits with time surface.
- High resolution sedimentary proxies for flood plains lake (short and long cores/time series)
- Calculation of carbon accumulation rates for different time periods at the study sites.
- Assessment of the role of climatic changes in the erosion-transport and sediment and carbon balance in the Amazon basin.

Preliminary Cruise



















