

AMAZONICA

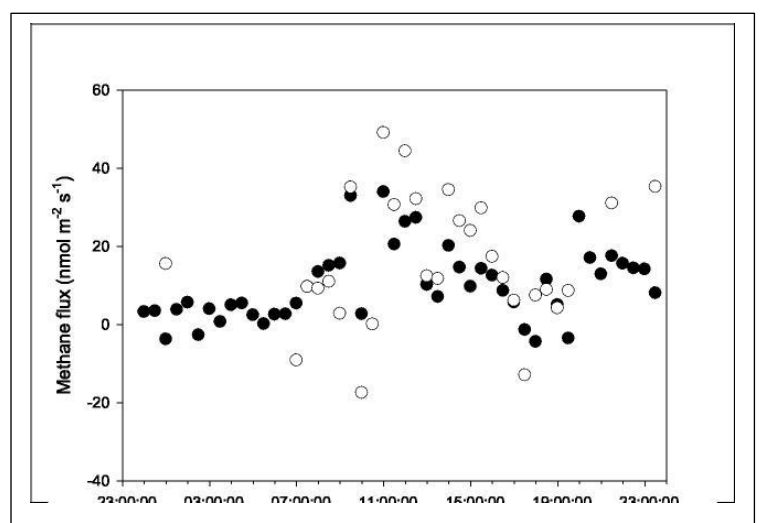
February 2011

The Edinburgh and São Paulo group conducted the first measurements of methane fluxes over a river surface in Brazil. The data are from the Araguaia River at Bananal Island, during February 2011 (Fig 1). They used a small tower on the edge of the river, choosing the location so that all data represent the fluxes from the river surface. The two separate measuring systems give similar results (Fig 2). The fluxes are somewhat less than those we have measured over a sheep pasture, and much less than those measured by others over rice paddy fields, but similar to those reported from sphagnum bogs. The team also measured the fluxes of CO₂, water and sensible heat.



Fig 1. - Observation tower, for measurement of fluxes of methane, carbon dioxide, water and sensible heat. The picture shows Anitra Fraser maintaining the instruments.

Fig 2. - Fluxes of methane measured on 20th February 2011, Araguaia River, Brazil. The fluxes represent half-hour means of fluxes over the river, obtained with the Los Gatos (closed circles) and Li-Cor (open circles) gas analysers.



Tambopata Fieldtrip - February - April 2011

The first long term field campaign at the Tambopata site was carried out in spring 2011. Sampling points were established in two small streams at the site and in La Torre and Tambopata rivers. During the 3 months campaign, samples for dissolved inorganic carbon (DIC) analysis were collected from these streams and rivers, targeting the hydrological variability. This meant regular night time sampling during the rain events in order to track the changes in water level. Less frequently dissolved organic carbon (DOC) samples were also collected. These samples were filtered on field and the filter paper used to quantify the particulate organic carbon (POC).

A floating chamber connected to an IRGA was used to measure CO₂ fluxes from these water bodies directly on field. DIC analysis using the headspace method yields both $\delta^{13}\text{C}$ and total CO₂ concentration data. Using the water chemistry data, potential for out gassing is calculated. The field CO₂ fluxes provide a point of comparison for these calculated flux estimates. Furthermore, at these sampling points water chemistry variables such as pH, conductivity and dissolved oxygen were monitored at high resolution. Also the water temperature and atmospheric pressure were logged. The small streams were gauged with pressure sensors, the cross sections measured and the relationship between stage height and flow velocity assessed to allow calculating discharge.

Discharge data are required to calculate carbon budgets in the streams. In addition to speciating the DIC pool for the potential out gassing, the water chemistry data can be used to model carbon concentrations out with the sample collection periods as these data loggers were left in-situ to collect data.

The results of this field campaign yielded information on the wet season carbon fluxes. The next field campaign will start in early September and last until mid-December 2011. The aim of the upcoming trip is to sample the end of the dry season as well as to catch the interesting transition period from dry to wet when the small stream that have been dry fill with water.



Leena Taking DOC sample

Leena's Lab



October 2010 - April 2011

An update from the Amazon-wide Greenhouse Gas measurement program

L. Gatti, E. Gloor, J. Miller, A. Martinewski, L. Basso, L. Gatti, H. Rocha, J. Lloyd

Regular biweekly aircraft based profiles have been made and samples analysed for CO₂, CO, CH₄, N₂O and SF₆ for the full year 2010 (in total ~ 80 profiles). Aircraft stations include Santarem, Alta Floresta, Rio Branco and Tabatinga. The data from the aircraft sites and atmospheric transport information (back-trajectories) have permitted us to determine seasonality, annual net and purely forest carbon uptake and release, as well methane sources for an area covering approximately 2/3 of the basin. The results are very interesting and we are currently in the process of writing two manuscripts, one on CO₂ and one on CH₄. The results are in line with the results of Phillips et al. 1998 who discovered a large forest sink and the suggestion that this may be a response to a change in the atmospheric environment (e.g. J. Lloyd, pers. comm.). We have also started measurements at three stations located at the Atlantic coast to sample the concentration of incoming air. These include Salinópolis – Pará, Natal – Rio Grande do Norte and Calçoene – Amapá.

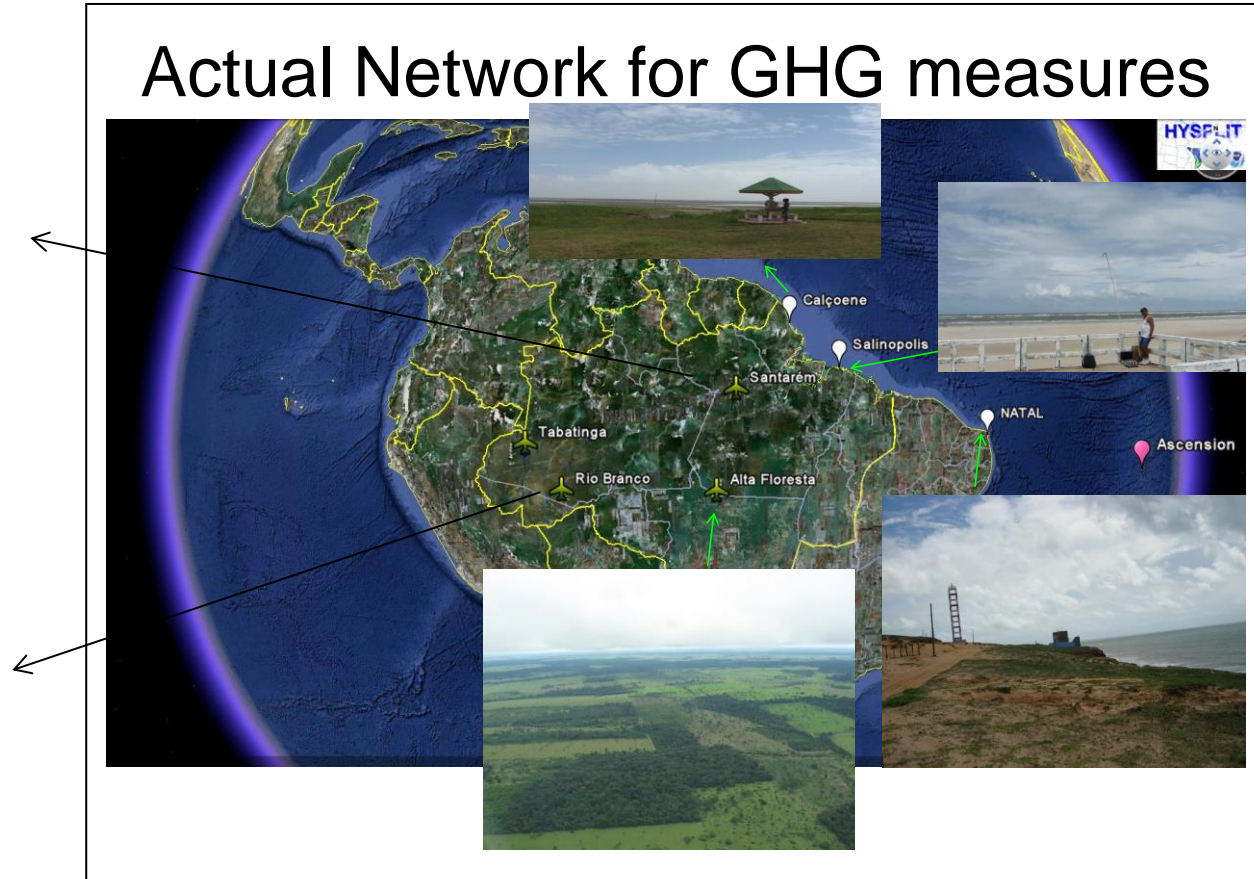
Actual Network for GHG measures



Santarém



Rio Branco



29 - 30th June 2011

The School of Geography (University of Leeds) hosted the **AMAZONICA/MOORE/TROBIT** combined annual project meeting, with around 30 participants from around the UK and beyond focusing on the carbon balance of the Amazon region. Manuel Gloor and Oliver Phillips coordinated the meetings. Many thanks to Joana Ricardo and Samantha Bowman for their valued behind-the-scenes help, and to everyone in our postgraduate and research community for their enthusiastic involvement.

August 2011

Contribution by Tomas Domingues (Universidade de S. Paulo)

Last August, the new 43 metres tower at the Explorer's Inn, Tambopata (The SAGES-RAMIRO tower) became fully operational and is constantly monitoring the exchange of Carbon, water and energy between the atmosphere and the forest. By taking readings 10 times each second (10Hz), it will enable calculations of how much Carbon is being taken from the air by leaves through photosynthesis and how much is being respired back to the atmosphere. Also, pioneering measurements of flux of methane gas (CH₄) will not only help constrain the annual carbon budget of that tropical vegetation, but will also provide invaluable information on the influence of seasonality over the processes governing the decomposition of organic matter.



Flux Tower – Tambopata, Peru