

# Hydrology and hydraulics of the Amazon floodplain

## Supervisors

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## Project description:



The Amazon is the largest river basin on the planet, yet relatively little is known about the hydrology and hydraulics of its vast floodplain. This is surprising as the floodplain is a critical component of the terrestrial water balance and because the water flow controls of host of other sedimentological, chemical and ecological processes. This PhD will therefore address three fundamental science questions for the first time:

- What volume of water is routed through the Amazon floodplain and along what pathways does this flow occur?
- Within the floodplain how does water from the Amazon River interact with locally sourced water?
- For how long does water in the Amazon floodplain reside?

The few studies of the Amazon floodplain conducted to date have used a variety of methods including hydraulic and hydrological modelling, remote sensing and field data. However, none of these approaches on their own is capable of answering the above questions. This project will therefore use two dimensional hydraulic modelling and constrain this with both satellite and field data to give an (almost) spatially and temporally continuous understanding of floodplain hydraulics. For this the student will further develop the University of Bristol's LISFLOOD-FP hydraulic model to better account for the impact of hydrological processes on floodplain flow and then build, calibrate and validate a model for a 30,000 km<sup>2</sup> area of floodplain at the confluence of the Solimoes and Purus Rivers in the central basin upstream of Manuas. This model will then be used to conduct numerical experiments designed to answer the above three questions. The result will be an improved understanding of this hugely important system, with implications for other large wetlands around the globe.

## References:

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