

Dancing Rivers in the Amazon Basin, the science behind the movement of rivers: A data visualization platform

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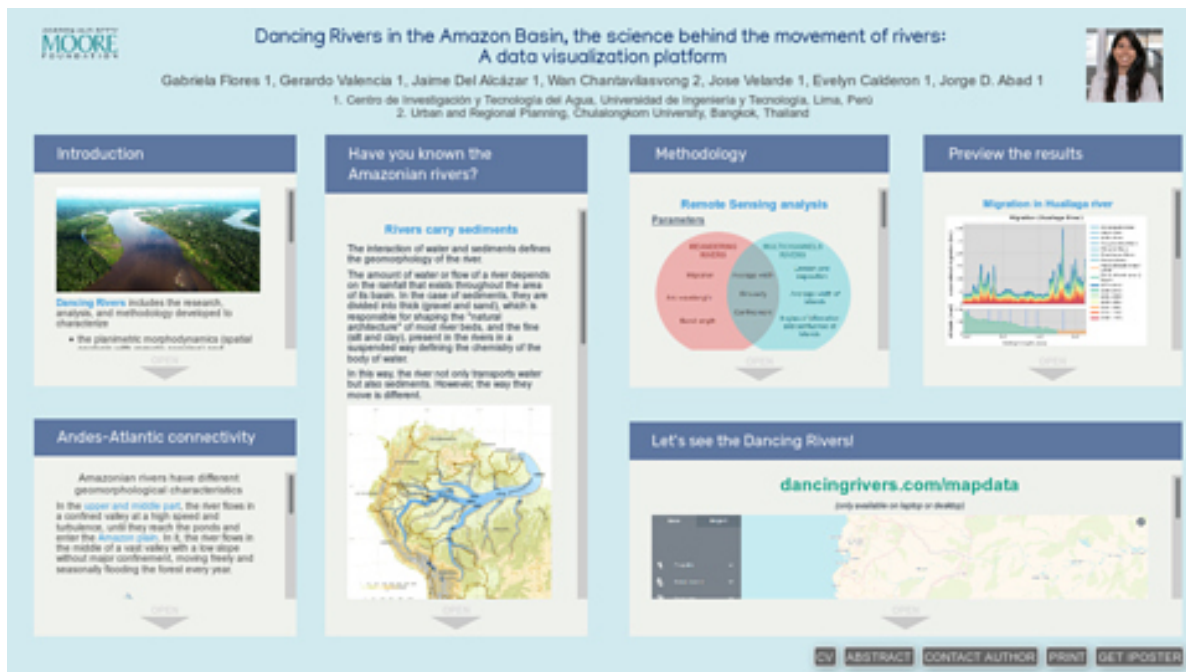
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Abstract

Through time rivers move, create erosion, deposit sediments and, consequently, change their shape, however, these movements are different for each river, since each one has specific characteristics and dynamics. While small movements occur every day, it takes us months, years, decades, or even centuries to notice those changes. As rivers are the fundamental sources of life in many cities, towns, and communities, and even determine geopolitical limits, it is more important than ever to understand the dynamics that involve them. Dancing Rivers is a visualization platform that characterizes river patterns and positions the importance of scientific studies of the Amazonian rivers. It includes and displays information about the research, analysis and methodology developed to characterize planimetric morphodynamics (spatial analysis with remote sensing) and altimetry features (description of river bedforms and sediment transport) of major Amazonian rivers: Marañón, Huallaga, Ucayali and the Amazon, with the purpose of disseminating and getting a better understanding of their physical dynamics, allowing stakeholders and researchers to make wise decisions involving the water resource and territorial planning.

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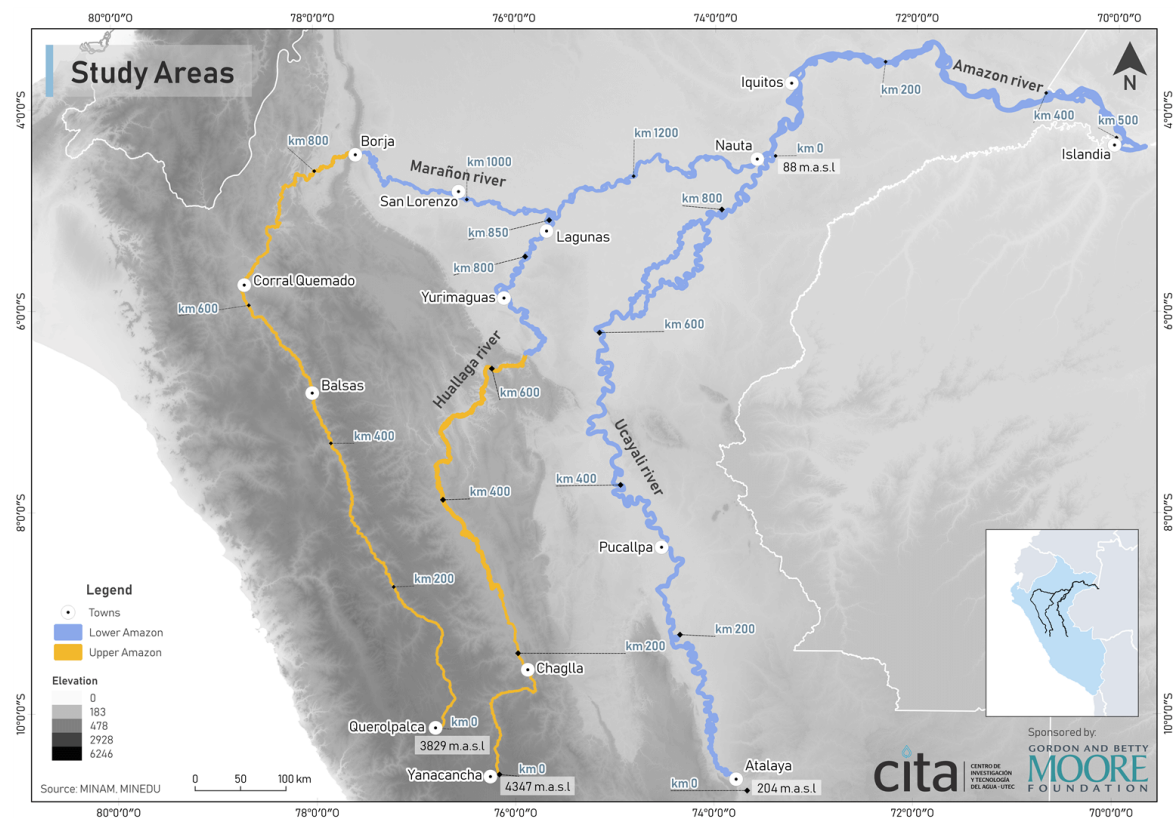
INTRODUCTION



Dancing Rivers includes the research, analysis, and methodology developed to characterize

- the planimetric morphodynamics (spatial analysis with remote sensing) and
- the altimetry (description of river bedforms and sediment transport)

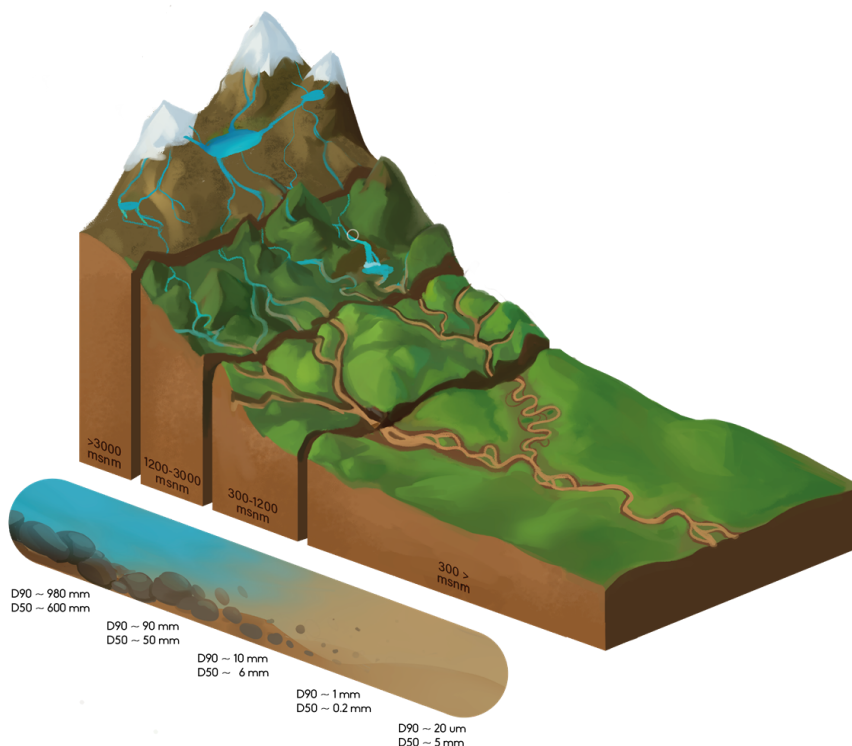
of the main Peruvian Amazon rivers: Marañón, Huallaga, Ucayali, and Amazonas with the purpose of knowing and get a better understanding of their physical dynamics.



ANDES-ATLANTIC CONNECTIVITY

Amazonian rivers have different geomorphological characteristics

In the [upper and middle part](#), the river flows in a confined valley at a high speed and turbulence, until they reach the ponds and enter the [Amazon plain](#). In it, the river flows in the middle of a vast valley with a low slope without major confinement, moving freely and seasonally flooding the forest every year.



This tour ends in the [Atlantic Ocean](#), where the Amazon River discharges all the water and sediment that has been collected from the Andes and allows the formation of mangrove forests that characterize this region.

HAVE YOU KNOWN THE AMAZONIAN RIVERS?

Rivers carry sediments

The interaction of water and sediments defines the geomorphology of the river.

The amount of water or flow of a river depends on the rainfall that exists throughout the area of its basin. In the case of sediments, they are divided into thick (gravel and sand), which is responsible for shaping the "natural architecture" of most river beds, and the fine (silt and clay), present in the rivers in a suspended way defining the chemistry of the body of water.

In this way, the river not only transports water but also sediments. However, the way they move is different.



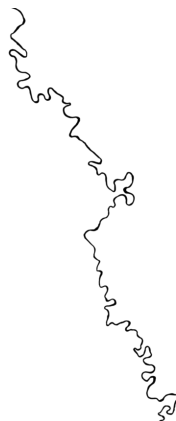


Source: Goulding, M. (2003). *The Smithsonian Atlas of the Amazon*. Washington: Smithsonian Books.

River diversity

Within the Amazonian plain there are, mainly, two types of river: the **meandering**, such as the Huallaga and Ucayali, and the **multichannel** such as the Marañón and Amazonas.

Ucayali river



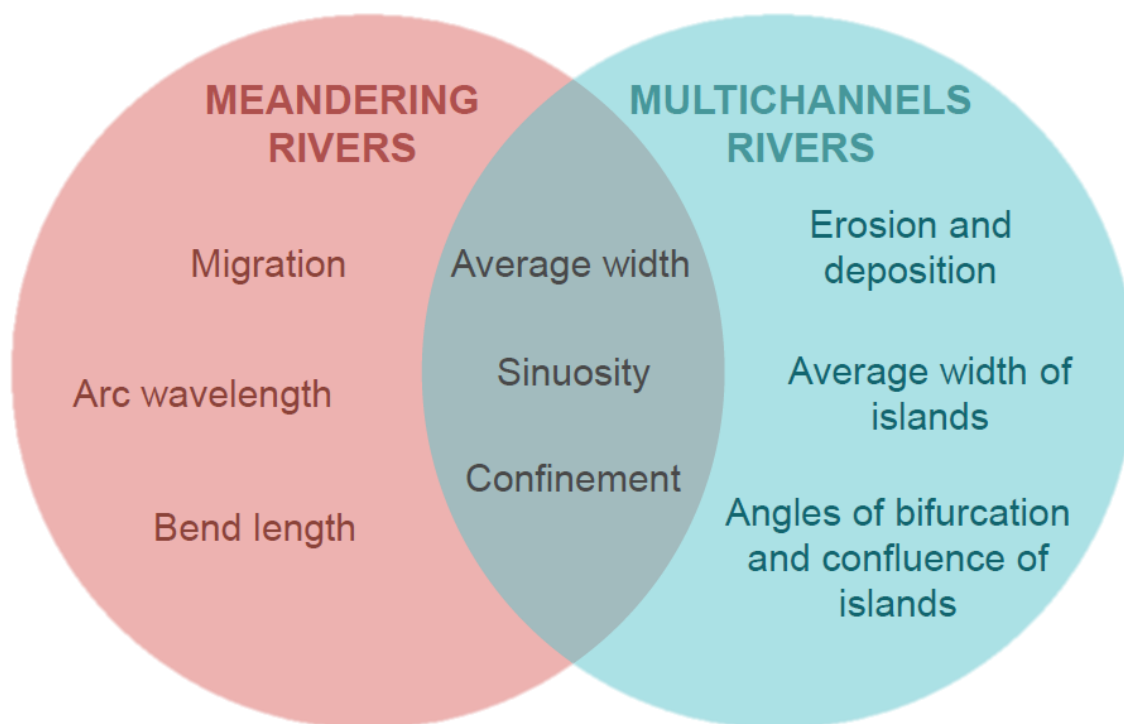
Amazonas river



METHODOLOGY

Remote Sensing analysis

Parameters



Field Measurements

Hydrodynamic Unit (UHD)

Width, depth, channel area, velocity, and flow rate through measurements in cross sections along the river.

Hydrogeomorphological Unit (UHG)

Describes river's bed morphology and calculates rates of bedload sediment transport. It also characterizes the temporal and spatial evolution of bedforms (sandbars, dunes, and ripples).

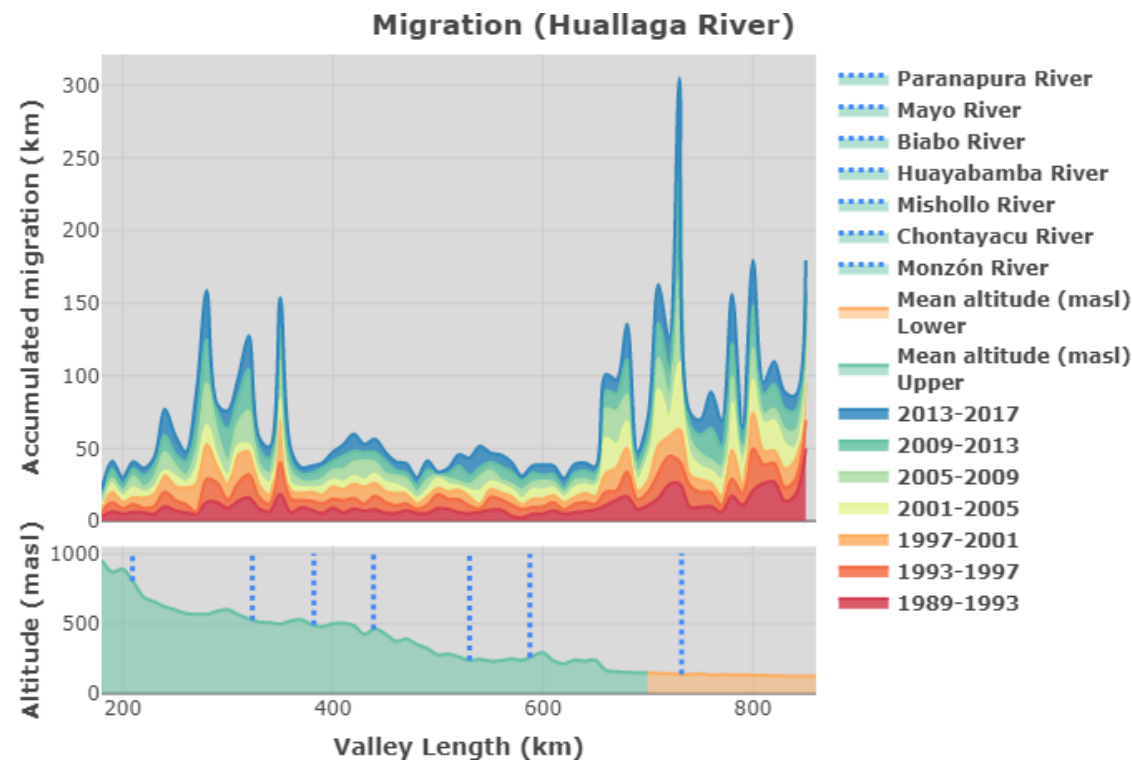
Hydrosedimentological Unit (UHS)

Estimate the transport rate of suspended sediments at different depths and the distribution of the grain size of sediments.

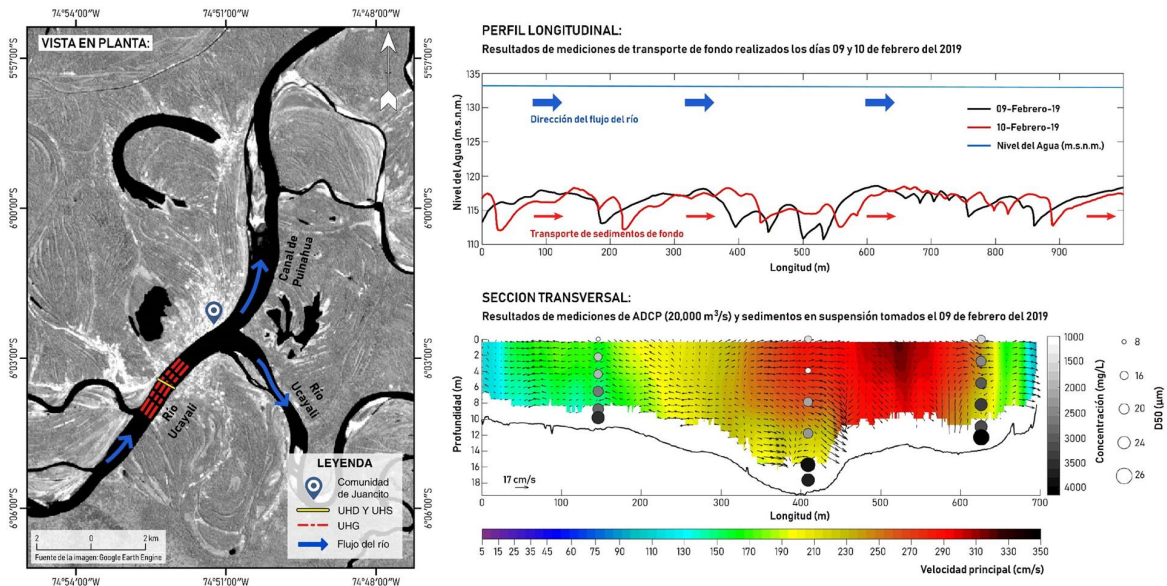


PREVIEW THE RESULTS

Migration in Huallaga river



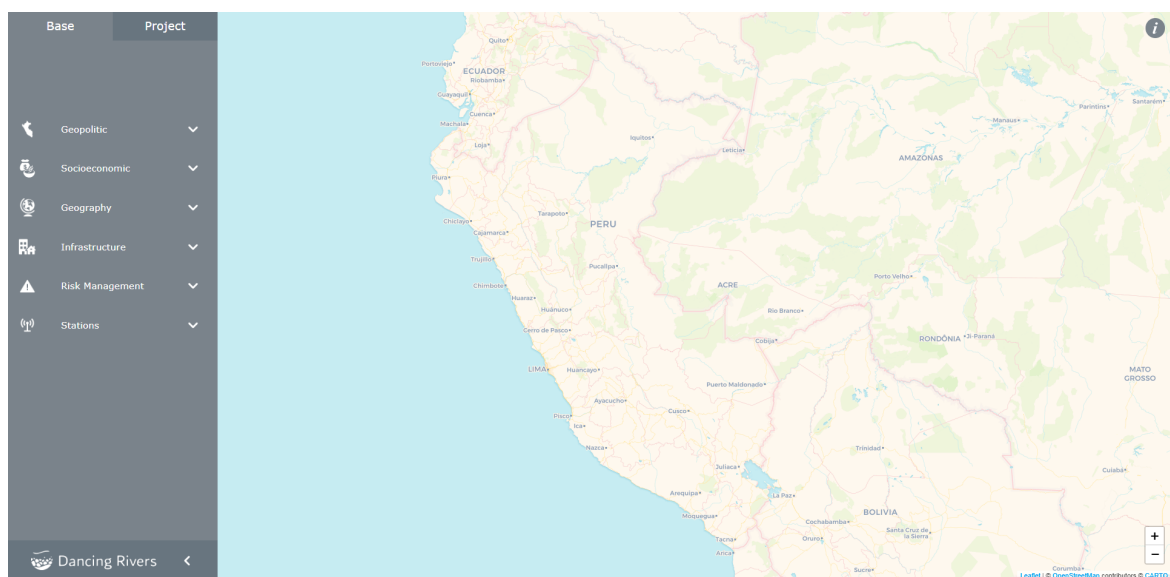
Sediment transport in Ucayali river



LET'S SEE THE DANCING RIVERS!

dancingrivers.com/mapdata (<http://www.dancingrivers.com/mapdata>)

(only available on laptop or desktop)



CV

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ABSTRACT

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