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Local and Traditional Knowledge in Watershed Governance

Tracking Changes in Fisheries in the Brazilian Amazon

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Brazilian Amazon

The Amazon Basin is the largest hydrographic basin in the world. People living along the floodplains of the Amazonian rivers have a mixed economy based mainly on small-scale agriculture, fishing and livestock.

With about 2200 species of fish, the Amazon basin is recognized as having the most diverse fish fauna in the world. Additionally, the average fish consumption per inhabitant is one of the highest globally, where most fish are caught by small-scale artisanal fishers.

These small-scale fishers exemplify all the **challenges local communities face in terms of food security, fisheries sustainability and conservation of the richest biodiversity in the world**. Studies done by the Federal University of Rio Grande do Sul in Porto Alegre, Brazil, and the *Tracking Change… Project*, conducted with local peoples in the **Tapajós River and the Tocantins River,** showcase the **rich biodiversity, fish species and the need for more community engagement in research**.

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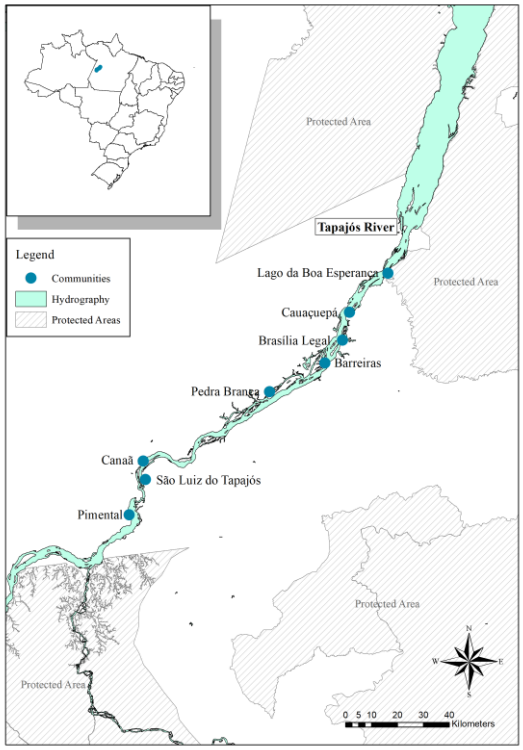
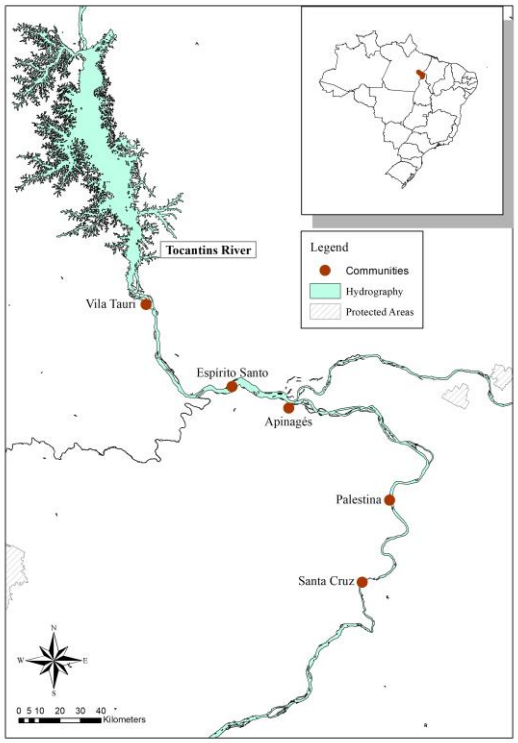
Where are we working?

Studies are taking place in two tributaries of the Amazon River: the **Tapajós River and the Tocantins River.** Both rivers have clear waters, with little clay sediment.The water is nutrient poor, and either very transparent or slightly green in colour. The human population in both rivers belongs to either the **Riverside or Caboclos** cultural group.





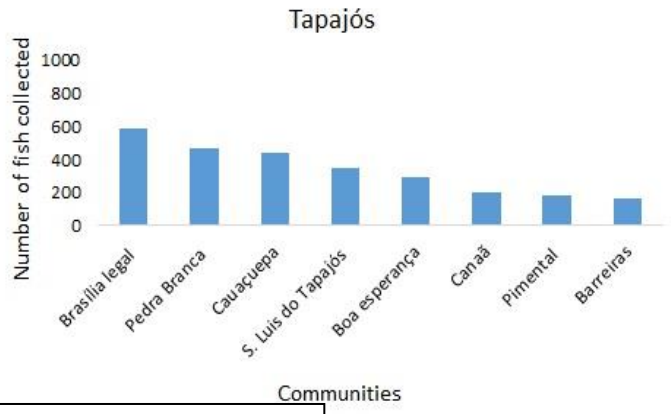
Maps by Kaluan Calini

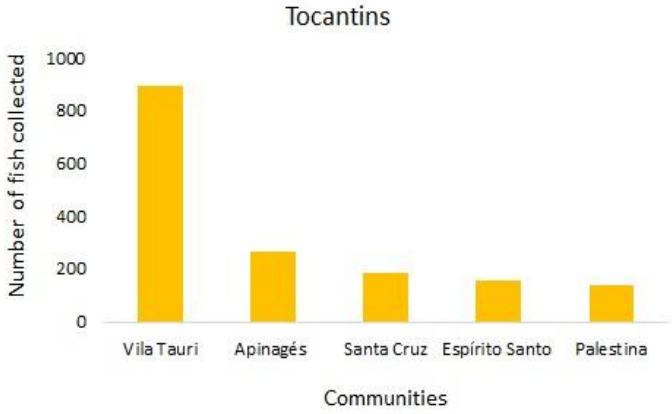
Objective of the Project:

The main objective of the project is to conduct a **detailed comparative analysis of the human ecology of small-scale fishing in two large clearwater rivers of the Brazilian Amazon that differ with respect to the history of environmental impacts.**

This research has interrelated methodologies: 1) interviews with fishers about socioeconomic aspects, fisheries management and local ecological knowledge about fish; 2) participatory monitoring of fishing landings; 3) standardized sampling of fish communities; 4) Mapping of important areas for fishing, spawning and fish migration and 5) analyses of stable isotopes analysis and mercury contamination in fish.

Images from left to right: Fisherman harvesting fish, Tapajós River, Tocantins River.





What is Stable Isotope Analysis?

Stable isotopes are types of natural elements with different molecular weights that do not decay radioactively. "Stable isotope analysis of elements such as carbon, nitrogen, and sulphur, is used in ecology to tract the flow of nutrients through food webs and assess trophic levels" (Springer Nature Publishing AG. 2019:1)[1]. **In other words, stable isotope analysis helps scientists understand aquatic food webs and ecosystem stressors!**

The studies collected numbers of fish/biological samples in 13 different communities, (8 in Tapajós and 5 in Tocantins). Fish tissue samples were processed to stable isotopes in order to analyse conservation units.

Study Data: Tapajós River

The Tapajós River presents conservation units and indigenous areas along its course. The Tapajós does not have dams yet, however, upcoming plans for dams will likely add another ecological stressor to local communities and species living along/near the river. Currently, major impacts are due to mining in upper reaches of the river, with possible contamination by mercury in piscivorous fish and in riverside communities.

Study Data: Tocantins River

The Tocantins River has fewer conservation units and several municipalities and communities are located on its margins, resulting in greater changes in the forest and greater fishing pressure. In addition, the Tocantins River has at least three dams along its course

Table 1: Number total of interviews and samples collected:

	Tapajós	Tocantins
Interviews	65	32
Samples Stable Isotopes	813	252

Image: Processing of fish tissue samples to stable isotopes analyses

1. "Stable Isotope Analysis". *Nature News,* Springer Nature Publishing AG, 2019, https://www.nature.com/subjects/stable-istopes.

For more project information visit our website:

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Image: Little Fisherman on the Tapajós River

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