

Project Update: October 2021

How is the project going?

I would like to report to the Rufford Foundation how we are evolving with Projeto Sapo Pantaneiro (Pantanal Toad Project – “Revealing amphibian diversity of Upper Paraguay River Basin (UPRB) and assessing Protected Areas (PAs) to shelter them under Land-Use and Changing Climate”). First, I would like to thank you once again for the trust and support that the foundation has given me. It was fundamental for my research in these dark years that Brazil is going through. During these 4 months, we did not carry out any new fieldwork. The months from April to September are marked by being cold and dry in Brazil and most amphibian species are inactive during this period. Now, again during the rainy seasons, we will be carrying out new expeditions. The main work carried out during this period was analysis, writing and environmental education on the internet. See some of our actions below:

1. Environmental Education and Scientific Dissemination

Face-to-face classes have not returned to Brazil yet and, due to this, we have not been able to access the students. We are talking with teachers to make an online educational dynamic through lectures and live chat. The printed material about the Pantanal amphibians is in its creation phase by the designer. We are creating a comic book art to get students' attention with important information about demystifying species, learning some characteristics, and how to proceed when finding an amphibian. Thus, we believe that we can generate environmental awareness to reduce the abuse and death of these animals.

We held three different lectures about our project and its research for undergraduate students in biological sciences, as well as other interested parties. I, representing the Sapo Pantaneiro Project, was invited by two national scientific meetings and one YouTube Channel to talk about the Pantanal, its amphibians and protected areas.

For the event "III HERPETORAMA - Biomes of Brazil", we present the first results on our research on the efficiency of PAs and climate change with the title "The importance of Conservation Units in the preservation of amphibians in the Pantanal and surrounding plateaus". The project was also present at the "Week of Science and Technology of the Federal Institute of Mato Grosso do Sul" talking about the Pantanal and its herpetofauna. Both lectures were recorded and will be made available in the future on YouTube.



We presented a lecture for the Youtube Channel "Ecoando Ciência" which promotes science and environmental education through the internet. This channel is from an Ecology Extension Project at the State University of Paraíba, north-eastern Brazil. In this live presentation on Youtube, I talked about the basic characteristics of the Pantanal, which is a small and unknown biome for many Brazilians, about its amphibians and all the dynamics of the floodplain cycles. The presentation is available at this link.

Revealing Amphibian Diversity: The *Pristimantis* Genus

This objective will have two scientific articles on the problematic taxonomy of the *Pristimantis* genus in the UPRB region that will solve this confusion. The article on the synonymisation of *Pristimantis ventrigranulosus* is ready, just waiting for the final part of the molecular analysis that is being redone. We will be submitting this article as soon as we are successful in amplifying the DNA.

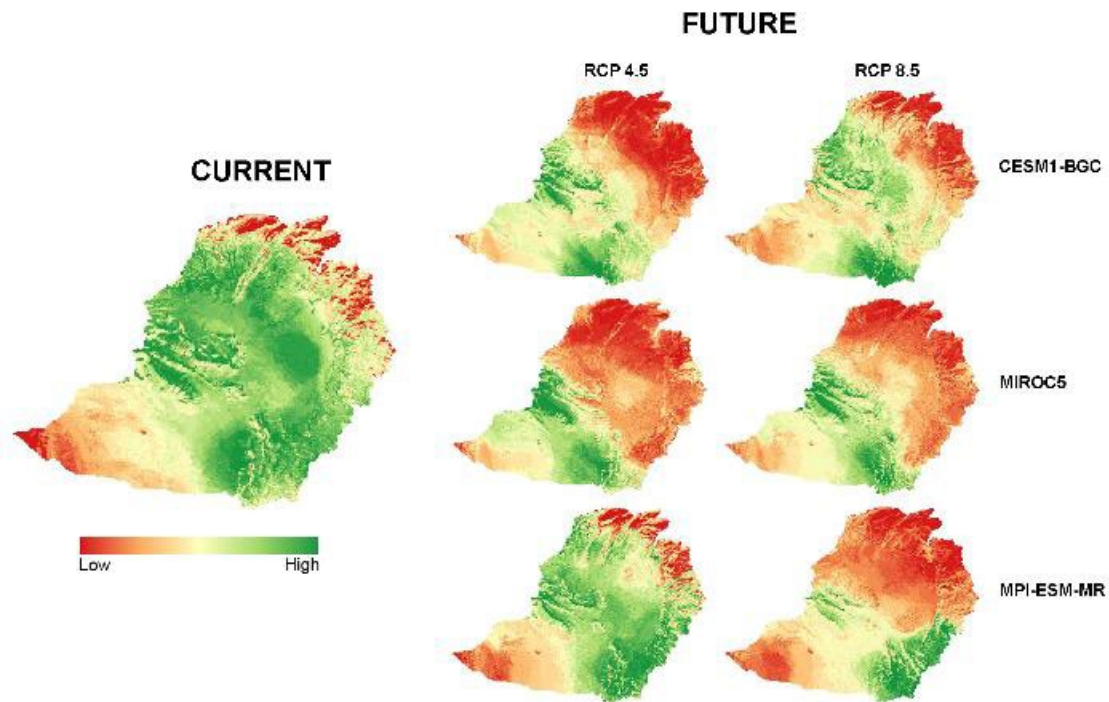
The second article is about the new species of *Pristimantis* from the Serra da Bodoquena National Park (SBNP). In April 2021, we did fieldwork in the area where the species has already been registered and we did not find any specimens, which indicates that the species only occurs seasonally during the rainy season. We are going to make the next field now that the rainy season is back. From the 22nd to the 26th November 2021 we will make an expedition in the Poção do Córrego Azul and the source of the Rio Taquaral, in the SBNP to find and collect the individuals. We don't have a sufficient number of specimens to make the description and we need more collections.

We are going on an expedition to the Nascentes do Rio Taquari State Park in January 2022. This expedition will last 15 days and will be attended by more than 10 people, including professors, researchers, students, masters and doctoral students.

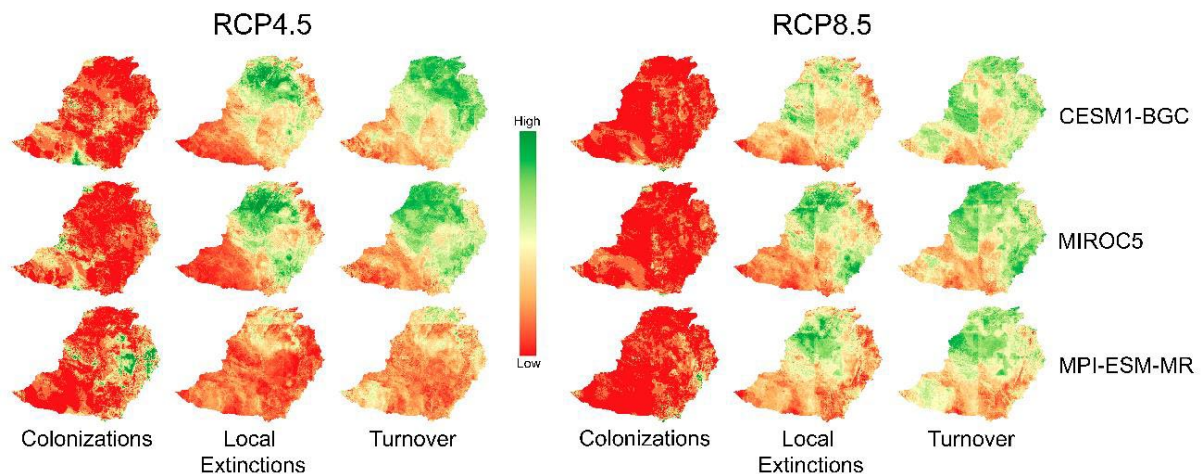
Revealing Amphibian Diversity: The Pantanal and Surrounding Plateaus

This was the goal that we have advanced the most in the last 4 months. I've run the species distribution models and done almost all the analyses. We only need to run the percentage of species coverage and prioritisation analysis through Zonation software. The writing of the manuscript is also already advanced according to what we are doing.

Our analyses indicate a richness amphibians' pattern for the UPRB with higher values in the southeast and northwest of the region and in some surrounding plateaus such as Serranía de Santiago in Bolivia and Chapada dos Guimarães, Serra do Amolar, Serra das Araras, among others, in Brazil. See the figure from the article about these patterns.



By comparing present and future projections (2080) considering climate change, we reveal where large species loss will occur, as well as turnover and colonisation areas. This is important for us to understand how species will behave with changes in their suitable areas. We found a high degree of species removal, that is, more than 28% of species occurring in the UPRB will lose their suitable areas across the region, with more alarming values in scenarios with higher greenhouse gas emissions. It is possible to see on the map below, which are these colonisation areas that will be important to shelter these species in the future.



We also found a low efficiency among PAs to house amphibian species. However, when compared to the entire UPRB region, values within PAs are higher for future colonised areas and lower for species loss and turnover, indicating good results. Our next step is to finish this part about PAs and finish the Zonation analysis.

