



DRYvER is a research & innovation project funded by Horizon 2020 focusing on drying rivers and the impact of climate change. The 4-years project started in September 2020 and brings together 25 partners from 16 countries in Europe and South America as well as from China and the USA. Its main goals are to collect, analyze and model data from 9 drying river networks (DRN) in Europe and South America to create a novel global meta-system approach that incorporates hydrology, socio-economics, ecology and biogeochemistry in order to craft strategies, tools and recommendations for adaptive management of river networks.

## ARTICLE N°1 DRYvER activities since January 2022: Focus on the two meetings

### Workshop CELAC

In March 2022, a three-day virtual knowledge exchange workshop took place involving members from WP4, WP5, and CELAC related academics and partner institutions. With over 20 participants from a wide range of institutions, the workshop was a large success. Across three half-day sessions the application of concepts central to WP4 and WP5 was discussed in the context of the CELAC case studies. The use of presentations alongside interactive elements, such as Padlet and Mentimeter, stimulated the exchange of knowledge providing academic members of WP4 and WP5 with a better understanding of the challenges faced by the individual CELAC countries, for example, Bolivia, Brazil and Ecuador. The presented concepts allowed the CELAC partners to discuss processes regarding the identification of the most prominent ecosystem services provided by drying river networks, how provisioning of these ecosystem services is likely to be affected by climate change and related changes in drying patterns, and how such changes in ecosystem provisioning can potentially be expressed in monetary terms. The final day of the workshop focused on the identification of desirable (and undesirable) futures for the case studies, how such futures can be made more

specific and measurable, and the kind of (nature based) solutions that are needed to achieve such a viable future. We thank all participants for their contributions and are looking forward continuing this knowledge exchange journey in the later stages of DRYvER.

### Consortium Meeting

In June 2022, DRYvER consortium, the stakeholder committee and advisory board meetings took place during three days in Lyon (France) and allowed most of the Consortium to finally meet for the first time, two years after the start of the project. The purpose of these meetings was to gather the participants to review the progress of DRYvER during the first two years, the preliminary results, and the upcoming steps and to discuss how to maximise the impact of the project. All work packages are progressing well, and time has been allocated to specific points had remained unclear until then such as the progression of the various DRNs, modelling and upscaling, co-creation, climate change scenario and cross cutting terminology and concepts. The meeting really helped to strengthen the links between the partners and has been a success, next one will be in September 2023!



CA meeting 2022 June



## ARTICLE N°2 Validation of DRYVER's first period by the EC

In May 2022, the first DRYVER review meeting took place. This was a meeting with the project officer and experts from the European Commission, to whom the Work Package leaders presented the essential activities they realized during first period (first 18 months of the project); the main positive points and difficulties.

The feedback from the project officer on DRYVER was very positive and all deliverables submitted were validated. The public ones can be found on the project website:

[dryver.eu/results/reports-and-documents](https://dryver.eu/results/reports-and-documents)



## ARTICLE N°3 Forum of Young Researchers (FYR)

**Amelie TRUCHY, a post-doc at INRAE tells us more about the Forum of Young Researcher (FYR), a group of young researchers realizing diverse activities within DRYVER's project.**

**Question:** Could you introduce yourself?

**Amélie Truchy:** My name is Amélie Truchy. I am currently doing a post-doc at INRAE. I started this position a year ago and I did my PhD and two Post-docs in Sweden. My research aims at understanding how global change and anthropogenic pressures can affect communities, ecosystem functioning and ultimately ecosystem services in freshwater ecosystems. With this post-doc position, I am a little bit outside my confidence zone as I also work with social sciences. In DRYVER, I am responsible for the communication around the smartphone app DRYRivERS and I am also building a citizen science network. Since June, I have co-animated the FYR with Naiara Lopez-Rojo.

**Q:** What is the FYR?

**AT:** FYR is the Forum for Young Researchers. It is basically a group within which younger researchers of DRYVER can communicate about specific topics, questions, etc. We can also coordinate ourselves on a sub-project, e.g. DRYVER carbon footprint or going to the same conference.

**Q:** Why is a project like DRYVER important for FYR?



**AT:** Being part of a European project such as DRYVER is a unique experience. Because DRYVER is such a big project, FYR can have access to a certain amount of money to support short missions between institutions that are part of DRYVER (STSM - Short Term Scientific Missions). There have been 2 calls so far and 5 missions were partly financed! This is such a great opportunity for young researchers to go visit other research institutions and start their own collaborations and projects. Thanks to DRYVER, we are in contact with other young researchers from all around the world. As we will grow together through DRYVER, the link that was established during the project will last - this is definitely an important feature when one wants to continue in academia and have their own network and collaborations.





**Q:** You meet other young researchers in conferences. How do you interact with them? Do they have a relationship with the FYR after you meet them?

**AT:** Unfortunately, Covid prevented us to meet in-person and go to conferences. Nevertheless, we had a nice chat at the General Assembly in Lyon back in June. It was cool to put faces on names! We had both an on-line and face-to-face meeting. During that meeting, we decided to let everyone know when we go to a conference so we can meet each other more easily and maybe meet other young researchers who are not part of DRYVER.

**Q:** How do you calculate the carbon print of DRYVER? How is it going?

**AT:** DRYVER's carbon footprint is calculated using a French initiative called Labos1point5. Labos1point5 is an international cross-disciplinary group of researchers who want to better understand and reduce the environmental impact of research, especially on the planet's climate. They developed a tool aiming at calculating the carbon footprint and evaluating the greenhouse gas emissions. The bespoke tool considers emissions from traveling, electronics, buildings and purchases.

We are four persons leading this work and it was a bit challenging at first to understand how the tool works, the kind of information required and how we could apply it to DRYVER to make it simple and intuitive. For the first half of the project (i.e. 2 years), we got the figures for 2/3 of the partners, which is a great achievement! We think this is an exciting project to carry out and we think it might even be the first time a European project has done such thing. We definitively aim for publication to put forward the efforts.

**Q:** What are the activities you plan in the next months with the FYR?

**AT:** For the coming months, we will keep working on the calculation of DRYVER carbon print as we are still missing information from some partners. We also want to design a survey to better understand how young and senior researchers feel when travelling long-distances (for business, i.e. conferences, study visits) while working on global change. Ultimately, we also want to think about how we can compensate DRYVER's emissions! Finally, we are planning to organize a workshop in 2023 - a workshop that would exclusively be for FYR and aside a conference (we have not decided yet which one; suggestions are welcome!). And of course, if young researchers have ideas for the FYR, they are always welcome to contact us!

## ARTICLE N°4 Case study presentation – focus on a CELAC

**DRYVER studies 9 case studies (DRN) in the EU and South America which cover different climatic and biogeographical zones. This month, we present the Brazilian case study.**



### Presentation of the DRN

The Bom Nome DRN is part of Benguê catchment, the Umbuzeiro river network, located in the Phytogeographic Domain Caatinga (an indigenous name for White Forest). It is a mosaic of Dry Forest (Sub-humid climate), Very Dry Forest (Semiarid climate) and Woodland (Arid climate) covered by a dense tropical xerophytic deciduous broadleaf vegetation, physiographically heterogeneous with a semiarid climate. It is important to empathize that Caatinga is one of the three arid/semiarid Phytogeographic Domain in South America. Due to these semiarid/arid conditions Bom Nome DRN is naturally intermittent.

**DRYVER studies the main Umbuzeiro river with their tributaries in two sections:**

- the Umbuzeiro River, 35 km long within Bom Nome river network of 250 km<sup>2</sup>.
- the Umbuzeiro River, 80 km long at the outlet of Benguê catcment (965 km<sup>2</sup>).





Data collection on the Benguê catchment encompass precipitation (six gauges), streamflow, soil moisture, evaporation, radiation, wind speed, temperature, relative humidity, and interception. Since 2020, we also measure the daily water balance in three other reservoirs.

## Presentation of the Team working in the DRN

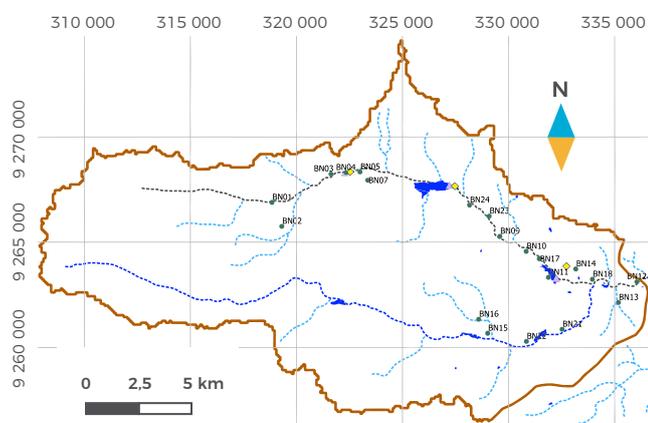
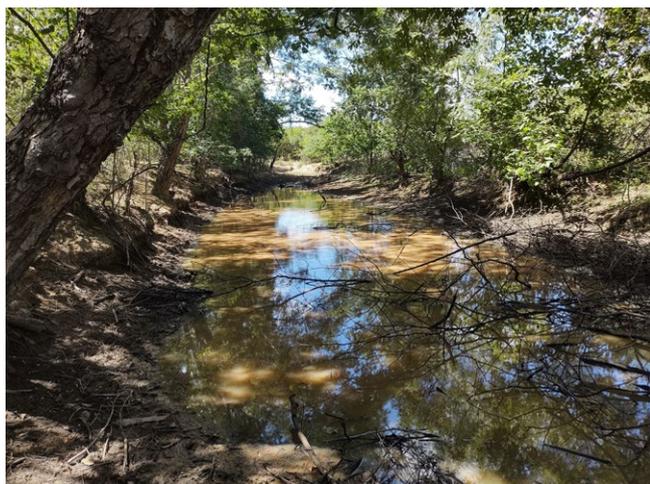
The Brazilian core team is composed of Carla Rezende, José Carlos Araújo and Carlos Alexandre Gomes Costa professors at the Federal University of Ceará, and two PhD students working on WP1, three on WP2 tasks, one PhD student and a Postdoc in WP3, and a master student on WP4. All PhD students receive CAPES Brazilian Grants and the Postdoc a CNPq grant. Field work in the DRN was done by the core team with the help of Telton Ramos.

Milena Gonçalves-Silva, Tamara Maciel and Elisa Cravo will travel for an Internship Exchange to INRAE during December 2022 up to July 2023, all travels costs funded by CAPES and CNPq.

## Why is this river network particularly interesting?

Most people imagine all over Brazil as Rain Forest with rivers flowing all the year, this is true for Amazonian and Atlantic Rain Forest regions, for example. Nonetheless, Brazil is a vast country with different biomes, among those we highlighted Caatinga, an interesting region with a lot of particularities as ephemeral and intermittent rivers. The main river of Bom Nome DRN Umbuzeiro River flows only for two or three months per year and intermittence is observed all over the basin for at least 9-10 months per year, the flow intermittent is a natural characteristic of the catchment due to semi-arid climate.

The region is almost pristine, remote, and sparsely populated. The main economic activities being agriculture and livestock and the use and occupation is low. Although, the biodiversity is considered low compared to others Brazilian regions, it has a high number of endemic taxa, and Near threatened and Vulnerable species, such as *Panthera onca* and *Leopardus tigrinus* are also registered.



Milena Gonçalves-Silva, Jessica Araújo, and Elisa Cravo





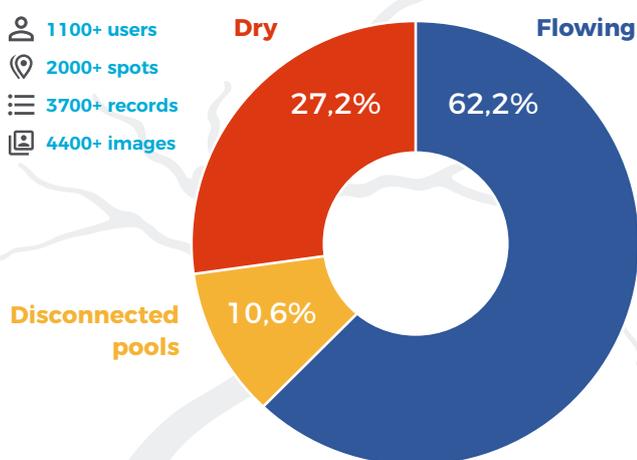
## DRYRivers celebrated its first anniversary at the end of September!

We are really pleased to see that the smartphone app is a real success. After a year of use, we count 1 100+ users who registered 3 700+ observations in 2 000+ stream reaches across 19 countries. 4 400+ images were also downloaded which is a great achievement as we can use these images for data quality control.

During the past year, we have released 3 updates, with each time new features:

- The first update consisted in including new languages, reaching now 21 available languages!
- The second update included new available statistics as well as the badging system. The badging system has been designed to keep users motivated.
- The third update brought in the pop-up notification tool that allows us to communicate more efficiently with users (e.g. upcoming challenges).

 1100+ users  
 2000+ spots  
 3700+ records  
 4400+ images



The webapp also got its share of new features: marker clustering on the map for a better visibility and new filter options. It is now possible to filter out the observations according to their current hydrological status (e.g. only dry streams are shown on the map) or to show the last hydrological status within the selected period of time. Finally, it is now possible to see the 5 most active users by sites, the 5 most active users by records and the 20 most active spots.

Based on all the observations that were recorded so far using DRYRivers, 27.2% had a dry status and 10.6% were for disconnected pools on average. When looking at the monthly data (from September 2021 to September 2022), the cumulative proportion of observed dry and disconnected pools states varied between 34% (in June) and 52% (in September), with the sole proportion of dry states reaching 41% in September.

We are currently working on some extra statistics as well as an efficient way of data quality control using the picture. And we initiated contact with researchers from the AMBER project in order to combine our maps with theirs to be able to produce an open-source map of IRES combined with river barriers towards the end of DRYVER.

Please spread the word for the  DRYRivers app and share the QR codes for easy download:



## Impressum

The DRYVER Consortium (<http://www.dryver.eu>)

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