

Community hydrological monitoring network through the coproduction of knowledge

(1) Centro de Investigaciones del Mar y la Atmósfera (CIMA), CONICET–Universidad de Buenos Aires (UBA), Buenos Aires, Argentina.

(2) Instituto Franco-Argentino para el Estudio del Clima y sus Impactos (IRL 3351 IFAECI), CNRS-IRD-CONICET-UBA, Buenos Aires, Argentina.

(3) Universidad de Buenos Aires, Facultad de Ciencias Exactas y Naturales, Departamento de Ciencias de la Atmósfera y los Océanos (UBA, DCAO), Buenos Aires, Argentina.

(4) CESSMA, UMR 245 Centre d'études en sciences sociales sur les mondes africains, américains et asiatiques, University Paris Diderot/ Institut de Recherche pour le Développement/Inalco, France.

(5) Programa de Estudios Rurales y Globalización (PERYG/CESIA), Escuela Interdisciplinaria de Altos Estudios Sociales (EIDAES), Universidad Nacional de San Martín (UNSAM), Argentina.

Camila Prudente^{1, 2}, Dr. Federico Robledo^{1,2,3}, Dra. Valeria Hernández^{4,5}





MOTIVATION

LOCATION

**THEORETICAL
FRAMEWORK**

HISTORY

**COPRODUCTION
METHODOLOGY**

**EXAMPLE OF
DIALOGUE**

HIGHLIGHTS

MOTIVATION

In South America, the provision of **climate services** at the regional and local levels is hampered by various **challenges**

A limited understanding of climate processes

Scarcity of in situ observations of meteorological variables

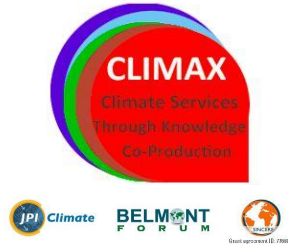
Difficulties in the social appropriation of scientific knowledge

The need to build effective communication channels between academic and local knowledge



CLIMAX Project

Climate Services
Through Knowledge
Co-Production



Objective: to co-produce climate-related knowledge to enhance the social response capacity to climate events that affect agricultural and energy sectors.

Argentina

Family farming sector

REGION



Two pilot cases of co-production

Brazil

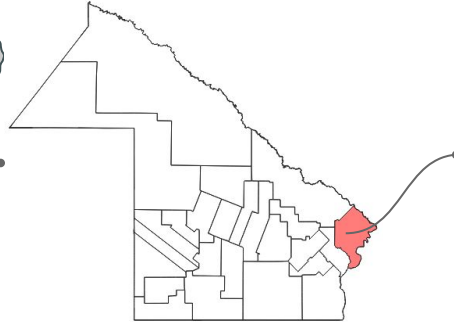
Hydroelectric sector

Coproduction in Bermejo, Argentina

Bermejo Department



Argentina

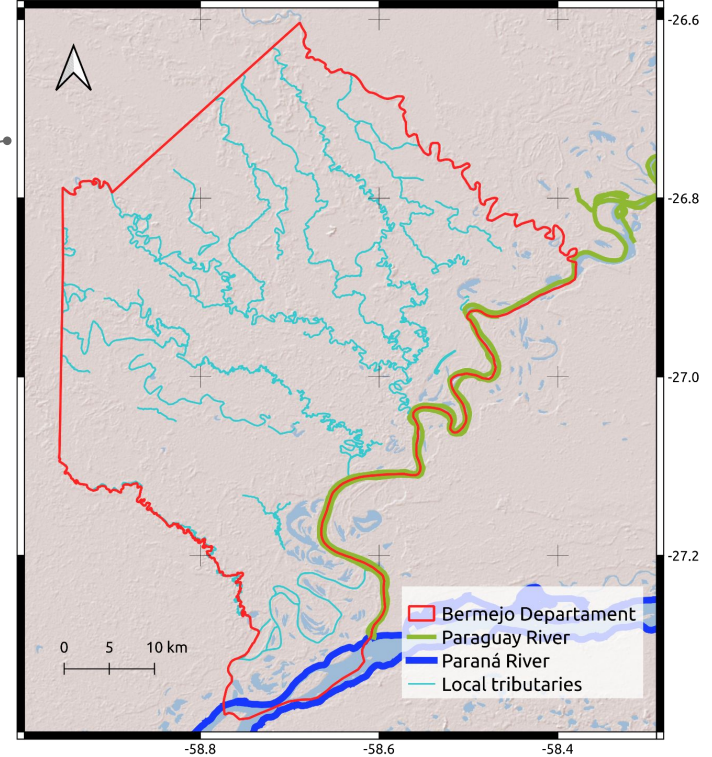


Chaco Province

WEBSITE



www.climax-sa.org



Theoretical framework

Implicated Science Approach

01

Non-instrumental dialogue

To understand the differences between the respective points of view and agree on the interpretative process that identifies encounters and discrepancies between judgements about the world

02

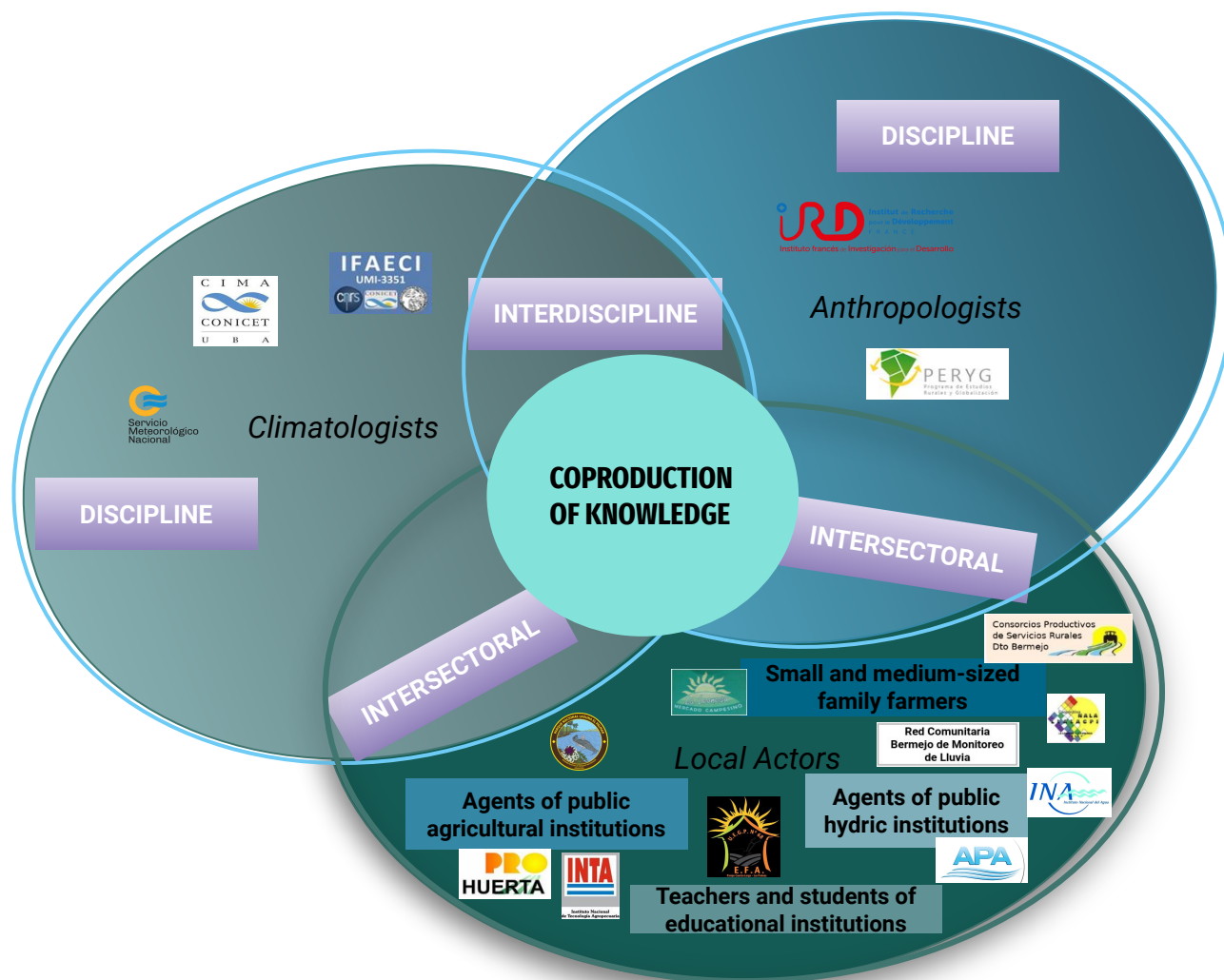
Symmetry of knowledge

The symmetrical valuation of the diverse knowledge systems involved

03

Asymmetry of power

Identification of social and power structures, existing relationships and tensions between the actors and knowledge systems involved (including scientists) and potential extra-territorial tensions



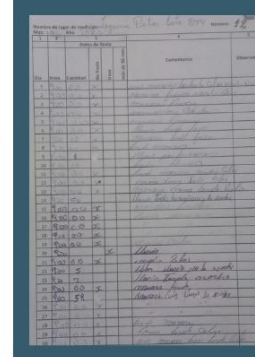
History of CLIMAX in Bermejo



2017
COPRODUCTION
FORECAST
WORKSHOPS
WITH LOCAL
COMMUNITY



2019
CO-DEVELOPMENT OF
WEB APPLICATION FOR
MONITORING AND
FORECAST

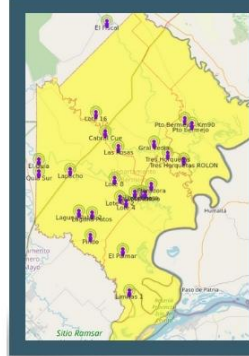


2021
EXPANSION OF THE
COMMUNITY
HYDROLOGICAL
MONITORING NETWORK

2016
ETHNOGRAPHIC
FIELDWORK BY
ANTHROPOLOGISTS



2018
COMMUNITY RAINFALL
MONITORING NETWORK
IN BERMEJO



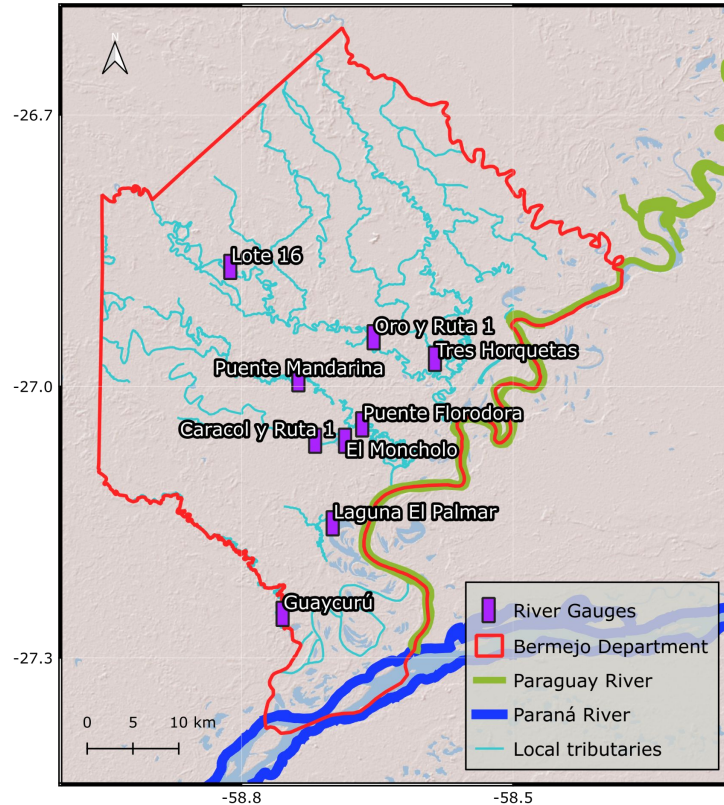
2020
VIRTUAL MEETINGS
THE CODEVELOPED
PRODUCTS STILL WORK



LOCAL INTEREST IN RIVER
MONITORING

MY PHD THESIS STARTS

Community hydrological monitoring network (CHMN)



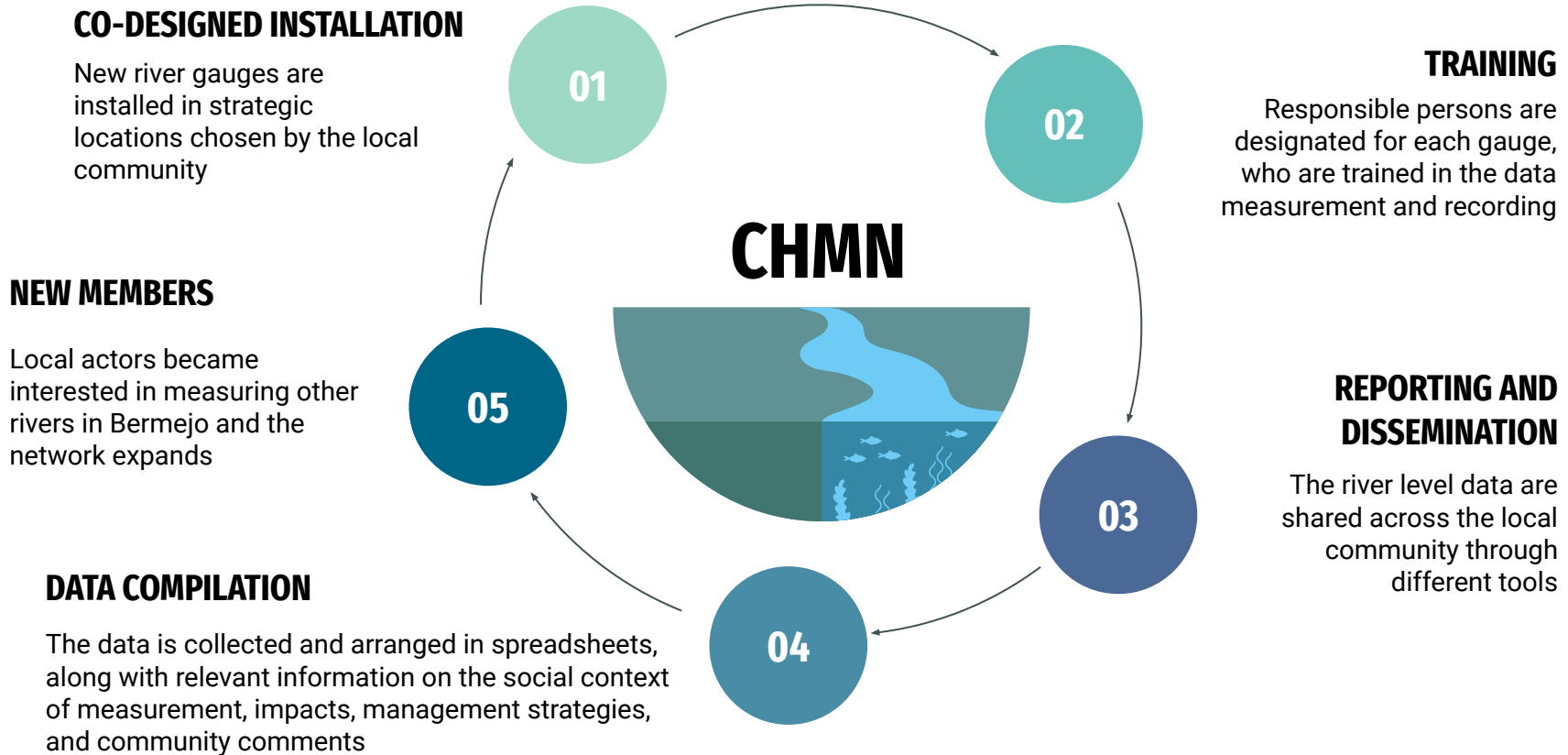
The first river gauge is painted on a bridge in 2018



There are currently 10 river gauges installed

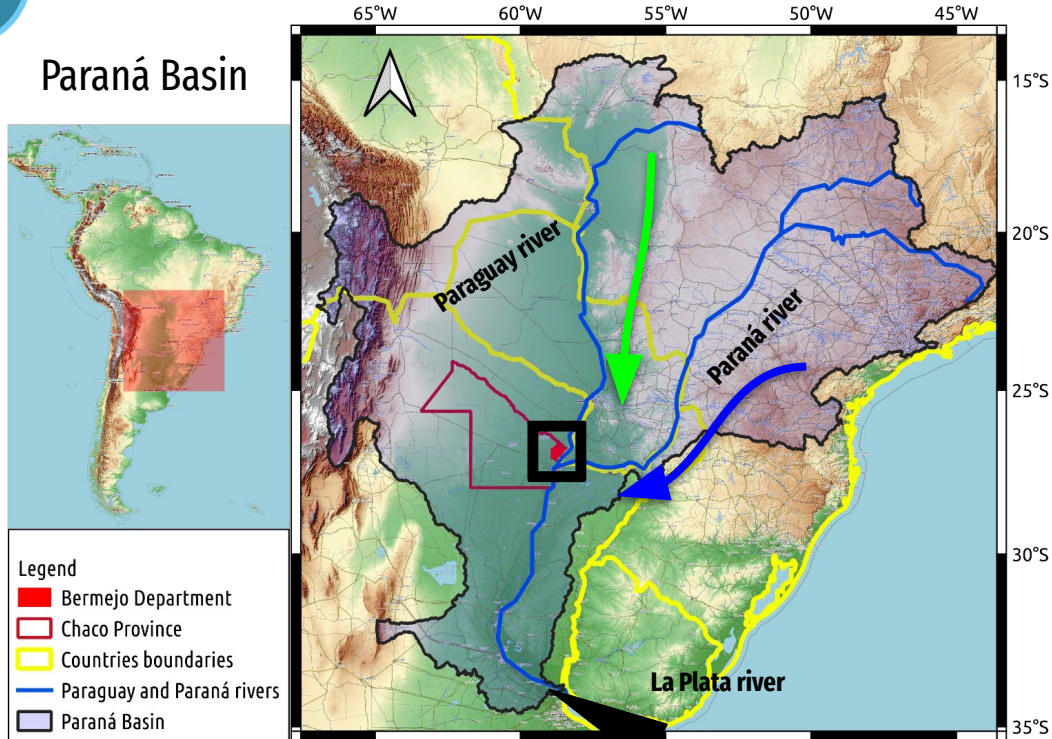


COPRODUCTION CYCLE - activities



How does the
water flow in
Bermejo?

Knowledge in dialogue



The **Paraguay River** is the main river east of Bermejo and flows into the **Paraná River** in the south.

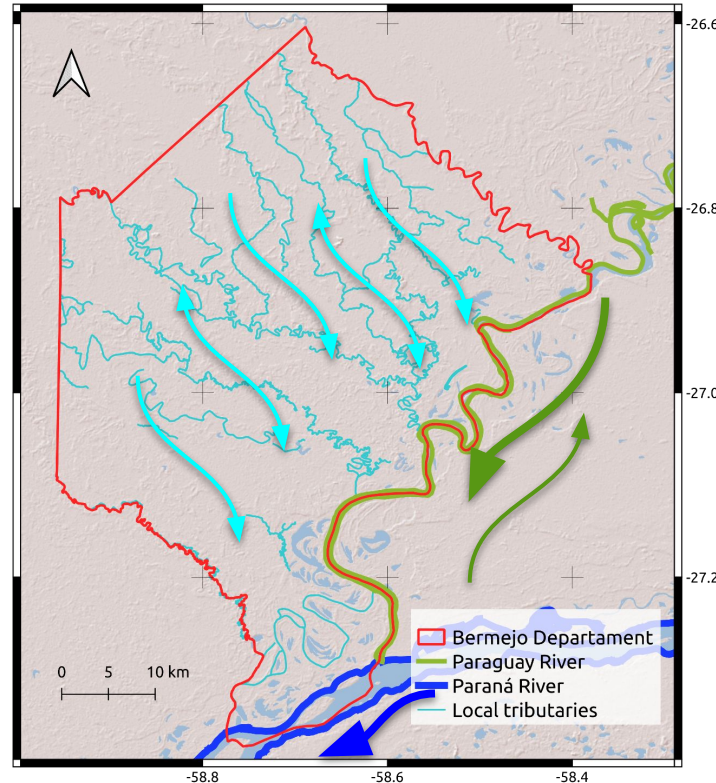
How does the water flow in Bermejo?

In general, the **local tributaries** flow from northwest to southeast.

The Paraná River can cause a **hydrodynamic backwater effect** on the Paraguay River.

Knowledge in dialogue

Bermejo Department



The region is an **alluvial plain** with a low slope of the terrain.

Local tributaries are affected by the movement of **main rivers** (fluvial floods) and by **local rainfall** events (pluvial floods).

How does the
water flow in
Bermejo?

The **local community** knows what levels the water has reached in extreme water events **qualitatively** (for example, watermarks on trees or recent memories).



Knowledge in dialogue



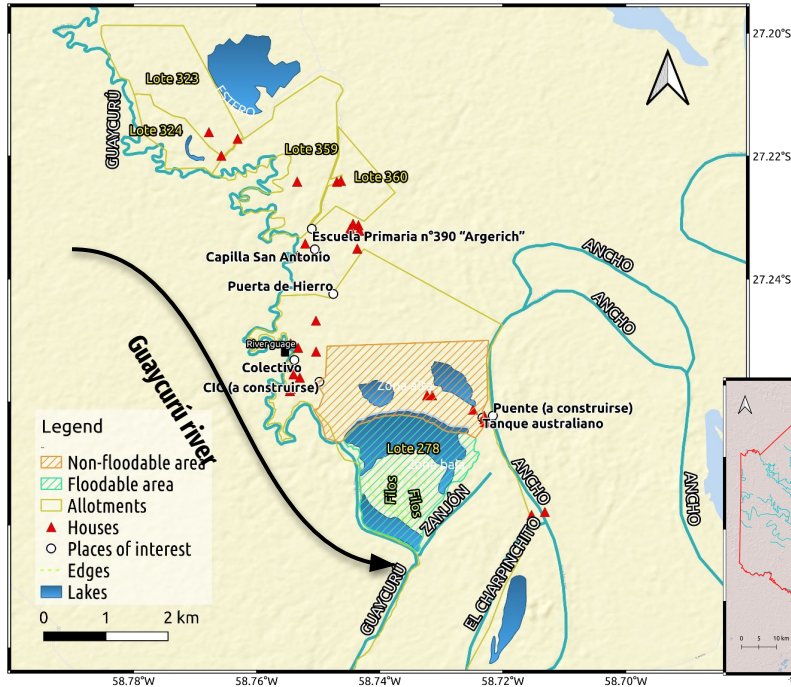
The local community is able to delimit areas potentially affected by **pluvial** and **fluvial floods**.

Small farmers have their own **flood early warning strategies** based on previous experiences in order to improve their productive management strategies.



Knowledge in dialogue

Community mapping activity in
"Limitas", south of Bermejo



Farmers are warned of **potential floods** from the **thresholds of the Paraná River**



They apply **preventive strategies** such as moving livestock to high, non-flooded areas.



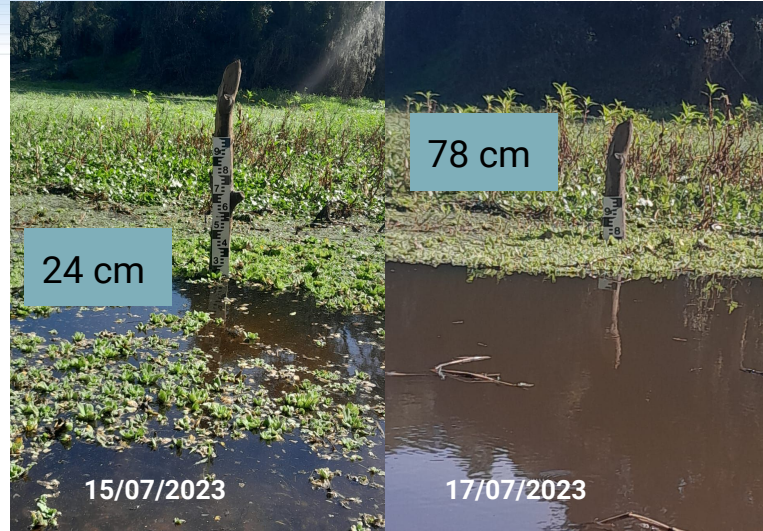
Knowledge in dialogue

Flood event of the Paraná River in a dry scenario



On July 13, a flood pulse of the Paraná River is evident

On July 15 and 17, the CHMN reports the pulse that reached the Guaycurú River



	Fuente Prefectura			Fuente Prefectura			
Expresado en metros	Río Paraná			Río Paraguay			Río Guaycuru
	IGUAZU	ITUZAUNGO	CORRIENTES	LAS PALMAS	PTO BERMEJO	PILCOMAYO	LIMITAS
2023-07-18							0,7
2023-07-17	10,6	1,6	3,26	3,05	2,88	2,88	0,78
2023-07-16	12,6	1,98	3,01	3,1	2,95	2,9	0,55
2023-07-15	16,2	1,98	2,55	2,66	2,93	2,9	0,24
2023-07-14	18,5	2	2,2	2,46	2,88	2,9	-0,1
2023-07-13	16,7	1,9	1,98	2,1	2,6	2,9	bajo
2023-07-12	14,9	1,3	1,85	1,9	2,35	2,9	bajo
2023-07-11	8,8	0,8	1,94	2,05	2,27	2,9	bajo
2023-07-10	7,5	0,75	2,1	2,1	2,4	2,92	bajo
2023-07-10	6,8	0,55	2,29	2,1	2,4	2,93	bajo

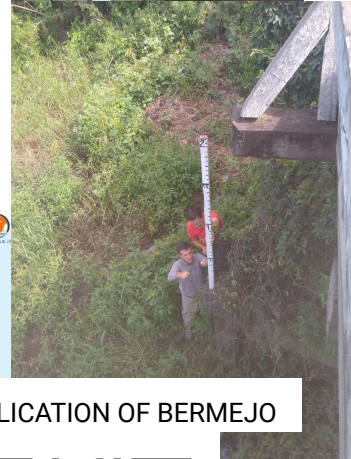
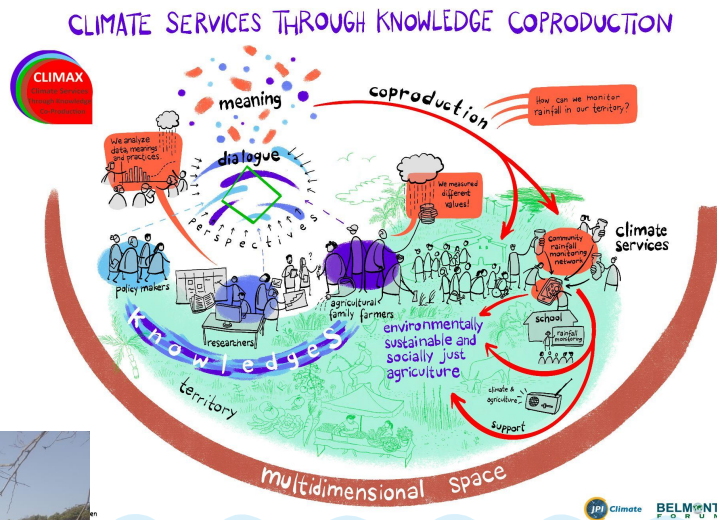
The CHMN allows us to quantify the change in local rivers and relate it to the thresholds of main rivers historically used by farmers.

Highlights

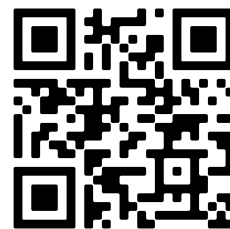
01	Qualitative information becomes quantitative information through new measurements of local river levels, allowing the impact of extreme events to be assessed.
02	The local community develops autonomy to be able to produce and socialize co-produced knowledge on the river levels.
03	The community hydrological monitoring network can promote the development of a flood early warning system.
04	This study provides a relevant instrument to improve adaptation strategies to extreme climate events.

Thank you very much!

¡MUCHAS GRACIAS!



WEB APPLICATION OF BERMEJO



bermejo.cima.fcen.uba.ar

CLIMAX WEBSITE



www.climax-sa.org

