

A large, ancient tree with a thick, gnarled trunk and sprawling branches stands in the center of a dense, lush forest. Sunlight filters through the thick canopy of green leaves, creating dappled light on the forest floor. The background is filled with more trees and dense foliage, creating a sense of a deep, untouched wilderness.

# Paraná River Enhancement Project (PREP)

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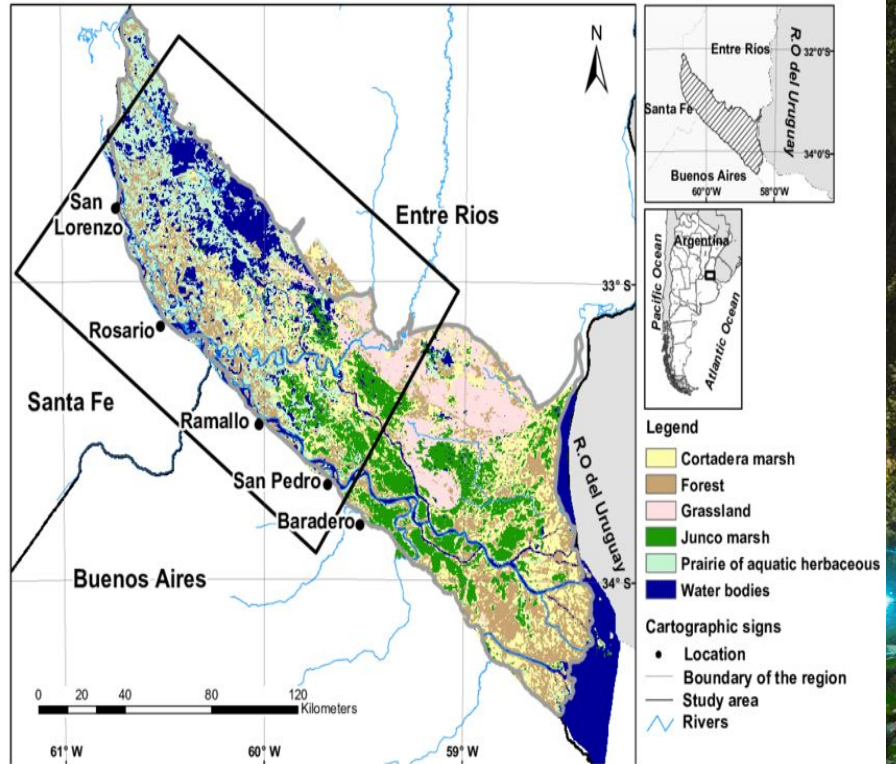
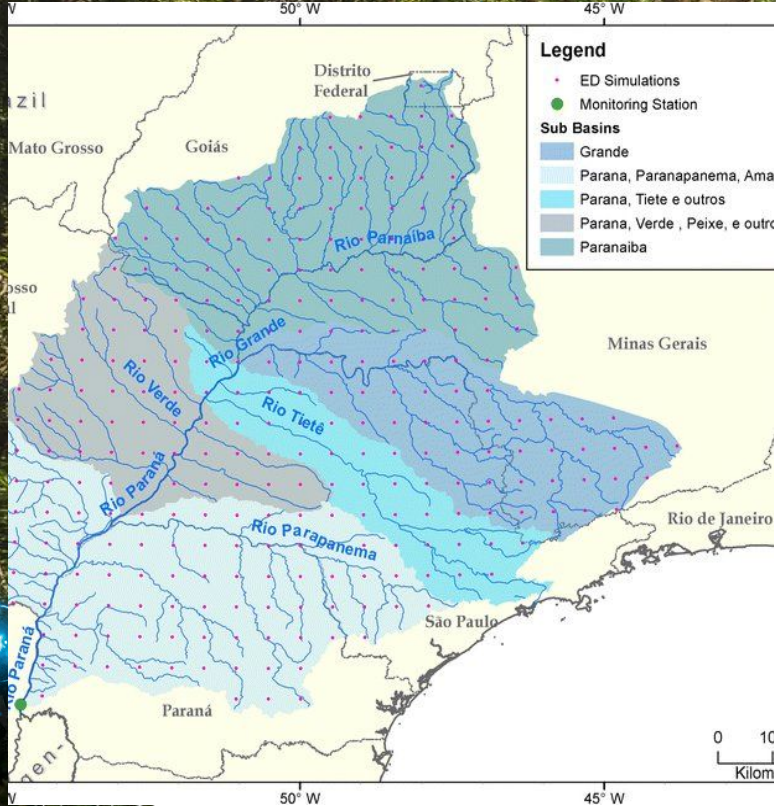
# Outline

- Background
- History
- Economics & Funding
- Mission Statement
- Policies & Mandates
- Problems & Goals
- Conclusion and Recommendations





# ARCGIS Watershed Maps





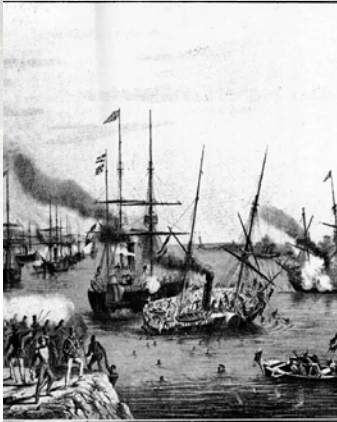
## BACKGROUND

- The Paraná River's basin has a total area of 1.08 million square miles, and is 3,032 miles in length which runs through Paraguay, Southeastern Brazil, Argentina and Bolivia, making it the 5th longest river in the world.
- It has three major tributaries the Tietê, the Paranapanema, and the Iguaçu, which all are sourced close to the ocean in Southeast Brazil.
- Has an annual average discharge of about 600,000 ft<sup>3</sup>/s, which is directly influenced by the flow rate of the Paraguay River, which sources 25% of the Paraná.
- Area around the Paraná is primarily agricultural and forested.





# History



- Europeans navigated South American rivers using steam merchants and warships.
- advancement in navigation through the Plata estuary by the use of vapors for trading in 1841.
  - avoided taxes
  - directly trade with interior cities in the country
  - export their products at a lower price.
- Rosas government declared that the Argentine rivers were closed to foreign countries.
  - England and France governments ignored this declaration leading to the Battle of Vuelta de Obligado.
- Around 1840, the first warship steamboats sailed the Parana river.
  - ships had the ability to overcome currents.
- Rivalry between Argentina, Brazil, and Paraguay over access to the river for international trade
  - tensions rose leading to battles on the river and attacks on naval fleets.
- In 1852, Justo Jose de Urquiza opened the river to international trade under a new Argentine government. The Parana river became the main exploration route in the South American interior.



# Economics and Funding

## Economics:

- Transports about 80% of Argentina's agricultural exports such as
  - Soy, corn, wheat, and other grains
  - Provides easy access and transportation to major cities in Argentina such as Rosario, Santa Fe, and Buenos Aires
- Power Generation



## Proposed Funding:

- Gain government support/funds from Argentina, Bolivia, Brazil, Paraguay, and Uruguay under the Treaty of the River Plate Basin
- Local businesses



“

## *Mission Statement:*

The goal of PREP is to raise awareness to the public of the declining water levels since it was declared an emergency and improve river quality as the people and the creatures that rely on this watershed are in serious danger of the degradation of this river by 2035.





# POLICIES and Mandates

## **Ramsar International Convention**

In 2016, the Ramsar International Convention designated the Parana delta a protected area. They designated it a protected area due to its important role in hydrological regulation and biodiversity.

## **Navigation Regulations**

Because the Parana River is such an important aspect in trading, navigation regulations are necessary in order to maintain safety of individuals, vessels, and the environment. For this reason, the Argentine Coast Guard has set up multiple speed limits throughout the river. It is currently at 9 knots.

## **Treaty of the River Plate Basin**

The Governments of Argentina, Bolivia, Brazil, Paraguay, and Uruguay came together to establish a treaty to ensure agreed development for the zone as well as the optimizing the use of the natural resources while ensuring its preservation for future generations.

## **Treaty of Yacyreta**

Both the presidents of Argentina and Paraguay came together in 1958 to sign an agreement regarding the studies used to obtain electrical energy from the Parana River and improve its navigation.



# Problem 1

## Problem 1: Lowest water levels since 2019

- Human impacts of burning fossil fuels
  - resulting in increasing temperatures across the globe.



Vulnerability to global warming due to hot and humid climate,

- problems are exacerbated by increasing temperatures.

Dependence on fossil fuel burning is crippling people who rely on river's resources

Boats rely on this river for transporting large amounts of cargo

- decreasing water depth making it unsafe for cargo ships to use this river for transportation,
- hindering the economic gains for the people of South America who live near this river.



# Problem 2

## Problem 2: Worsening issues of water flow rates and depth of the river due to hydroelectric dam construction.

- Advantages of hydroelectric dam construction
  - Provides power to many places along the river,
- Disadvantages of hydroelectric dam construction
  - hindering the flow of water
  - affecting turbidity
  - water quality of the river after the dam
  - negatively affect the biodiversity of the region.
  - Low flow and dams also affect the agricultural industry along the river where Argentina has lost an estimated \$620 million of soybean production due to decreasing water levels.





# PROBLEM 3

## Problem 3: Wildfires

- Increasing temperatures and decreasing water levels
  - Affect the natural forests and biodiversity.
- Decreased forest cover
  - Negatively affects the water quality of the Parana as forests act as a natural filtration system for rivers
  - Decreasing forest cover surrounding the river has a direct effect on water quality as well as biodiversity in the regions.





# 3 Goals

## Goal 1: Education

With this goal we want to educate local residents and all those involved with the Paraná River. By educating people about the importance of the river and issues surrounding it, we can change their perspective and teach people more ways to conserve and protect the river and its resources.

## Goal 2: Protecting Resources

Working to minimize issues caused by hydroelectric dam construction. This includes investigating new ways to generate electricity without causing harm to the surrounding biodiversity and water quality of the river.

## Goal 3: Protecting Quality

Working to protect the biodiversity and water quality of the river. For example, one way to work towards this goal would be to plant more trees to increase the forest cover surrounding the river which would improve the water quality.



# Conclusion and Recommendations

## Conclusion

- Immediate action to protect health of river including its water quality and biodiversity
- If nothing is done the river water levels will continue to drop, negatively affecting economics of the area, the environment surrounding the river as well as in accessible transportation and significant changes to the lives of the people who live on the Parana as well as those who rely on its exports.

## Recommendations

- Decrease fossil fuel use in the area
- dams to be removed or be made more efficient
- trees and foliage to be planted in the areas surrounding the river
- Obtain stakeholder support including local governments and local businesses



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# The End

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