Paraná River Enhancement Project

(PREP)

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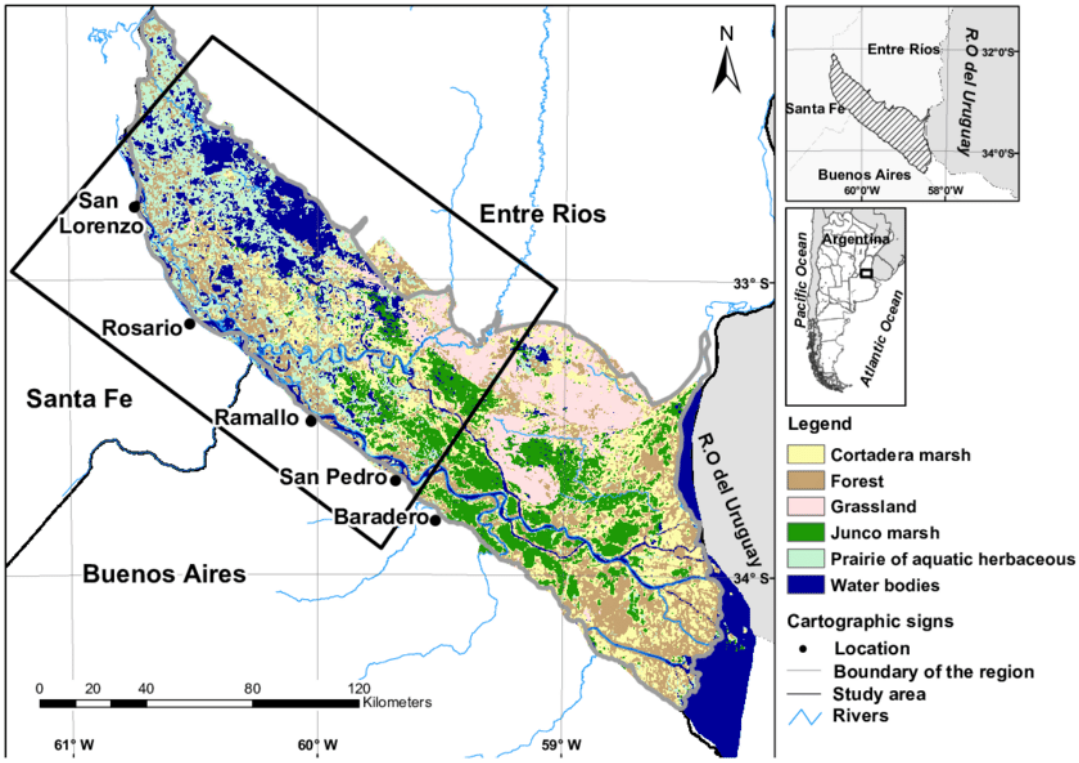
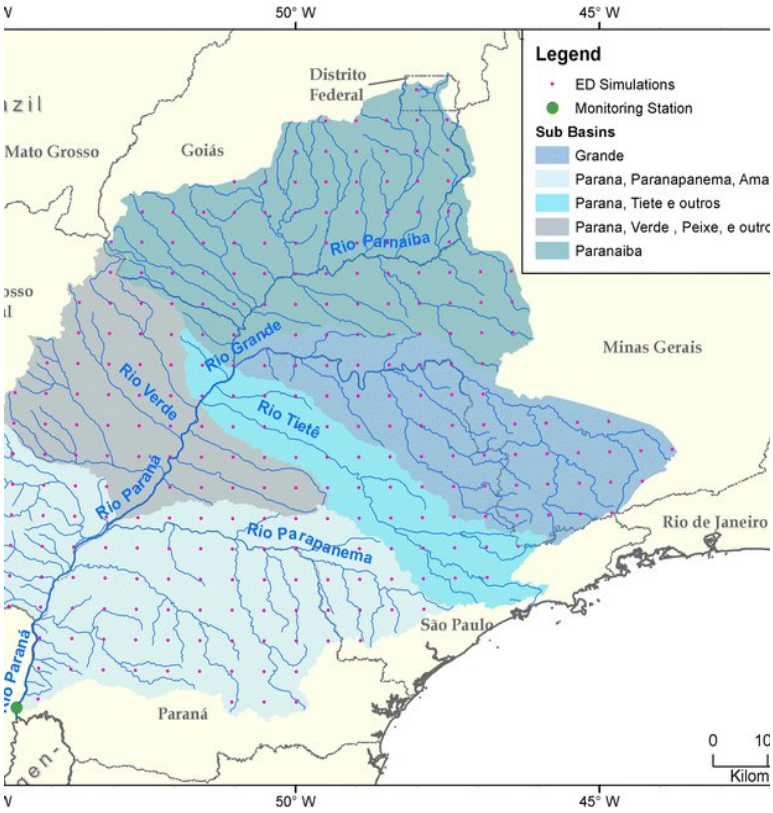
Mission Statement

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.

Maps



This map illustrates the types of covers surrounding this particular area of the Paraná river.



This map highlights some of the major sub basins of the Paraná River.

Background

The Paraná River is the second longest river in South America, after the Amazon River, stretching over 3,000 miles. The name of the river means, “that resembles the sea,” or “like the sea.” The three major tributaries which are all sourced close to the ocean in Southeast Brazil are the Tiete, the Paranapanema, and the Iguacu. The Paraná River’s drainage basin has a total area of 1.08 million square miles, and is 2,485 miles in length which runs through Paraguay, Southeastern Brazil, Argentina and Bolivia. It has an annual average discharge of about 600,000 ft^3/s, which is directly influenced by the flow rate of the Paraguay River, which sources 25% of the Paraná. The area around the Paraná is primarily agricultural and forested.

The Parana River is imperative to the people of Brazil, Argentina and Paraguay as it provides commercial fishing, cargo transportation, drinking water for millions, hydroelectric power, and supports rich biodiversity in the areas surrounding the river.

History

Sebastian Cabot was the first European to travel through South America where he diverted three Spanish ships that were originally destined to develop trade with the East. After three years of exploring, he went back to Spain where he was banished due to a failed expedition. The Europeans continued to navigate rivers using steam merchants and warships. Lord Palmerston advanced navigation through the Plata estuary by the use of vapors for trading in 1841. This not only avoided taxes but allowed them to directly trade with interior cities in the country and export their products at a lower price.

However, the Rosas government soon learned of their new routes and declared that the Argentine rivers were closed to foreign countries. Due to this new declaration, it closed access to Paraguay and other ports. 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. The advancement of steamboats was beneficial because this meant that ships had the ability to overcome currents. Due to the 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.

Over time in 1852, a man named Justo Jose de Urquiza opened the river to international trade under a new Argentine government. Soon the Parana river became the main exploration route in the South American interior.

Economics and Funding

The Parana River transports about 80% of Argentina's agricultural exports such as soy, corn, wheat, and other grains. It also provides easy access and transportation to major cities in Argentina such as Rosario, Santa Fe, and Buenos Aires. Another big advantage of this river that contributes to its economics is that it is a major source of power generation.

Our proposed funding would go to gaining government support/funds from Argentina, Bolivia, Brazil, Paraguay, and Uruguay under the Treaty of the River Plate Basin. Another source of funding would be from local businesses.

Policies and Mandates

Many policies and mandates have been enacted over the years in order to ensure safety of the river. A few of the many policies and mandates are included below:

Ramsar International Convention

The Ramsar Convention on wetlands of International Importance is an international treaty that works to conserve and protect sustainable use of wetlands. It was first signed in Iran in 1971. 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. The treaty was also enacted in order to establish firmer institutional arrangements for the River Plate Basin. There are many specific aspects that the treaty includes such as navigation, utilization of water resources, conservation and development of animal/plant life, promotion of other projects of mutual interest, etc. In order to stay on top of all aspects of the basin, the Ministers for Foreign Affairs of the countries meet once a year. Covered topics include policy guidelines, consultations of basin activities, adopt provisions necessary to ensure implementation, etc.

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. This treaty is meant for both countries to come together to

discuss upgrades to the resources of the Parana River, hydroelectric schemes, improving navigation, reducing effects of floods, etc.

Problems

Three problems associated with the Parana River are all based on human activities. First off, the Parana River as a whole has suffered the lowest water levels in 77 years since 2019. This can be attributed primarily to the human impacts of burning fossil fuels which are resulting in increasing temperatures across the globe. This river is especially vulnerable to global warming since it is in such a hot and humid climate, so the problems are only exacerbated by increasing temperatures. The dependence on fossil fuel burning is crippling the people who rely on this river's resources for life in that region. Boats rely on this river for transporting large amounts of cargo, and the decreasing water depth is making it unsafe for these cargo ships to use this river as a transportation method, hindering the economic gains for the people of South America who live near this river.

Figure 1. As you can see from the image below, the low water levels in the Parana River have many negative impacts

Another issue that is worsening the existing problem of water flow rates and depth of the river is hydroelectric dam construction. Although it provides power to many places along the river, it is hindering the flow of water, affecting turbidity and water quality of the river after the dam, and they negatively affect the biodiversity of the region. As the river continues to be dammed, it subsequently affects the river downstream of the dams, especially if multiple are in succession. 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.

Figure 2. Shown in the image above is a picture of the hydroelectric dam on the Parana River.

The final issue that stems from this is wildfires due to the increasing temperatures and decreasing water levels which affect the natural forests and biodiversity. Decreased forest cover makes the water quality of the Parana worse as forests act as a natural filtration system for rivers, so the decreasing forest cover

surrounding the river has a direct effect on water quality as well as biodiversity in the regions.

Figure 3. Above is an image of a wildfire on the Parana River.

Summary of Goals

In order to implement our mission, we defined three goals, with the first goal of education. Our first goal includes educating local residents and all those involved with the Parana 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. Our second goal includes 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. This also includes halting construction of new hydroelectric dams. Our last goal includes 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. All three goals are each important in their own way but fall under the category of protecting the resources and quality of the river.

Conclusion

The Parana River is extremely important not only to the surrounding countries and people, but to the biodiversity and habitats that the river and its surroundings provide. Immediate action is necessary in order to improve the issues harming the health of the river. The river is far from its former glory, and is currently hindering the growth of its surroundings. The river is currently being harmed by low water levels caused by fossil fuel use, incredibly low flow rates due to high amounts of hydroelectric dams, and intense wildfires that not only destroy the plants and habitats around the river, but also contribute to low water levels by raising the surrounding temperatures. With the use of education, investigating new ways to generate power, and working to improve the water quality and biodiversity of the river, we can accomplish our goals and restore the river back to its ideal conditions. 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

Obtaining stakeholder support such as local governments, local businesses that rely on the Parana River and the people who live on the river just to survive would be interested in raising money and involvement to work to bring this River System back to where it was a half-century ago. National Climate Conventions should also be made aware of the ailing situation in South America along the Parana to potentially sanction fossil fuel consumption in not just the Parana River region but also across the globe. On

top of this, dams and other cross-river constructions should be held to a minimum in the future, and any current constructions deemed unnecessary should be demolished in time. Any existing constructions that are deemed necessary should be optimized for flow rates, only producing the necessary electricity to power the area. Trees and other foliage should be planted along the banks of the river where possible to make up for what was lost in previous wildfires. Local fire departments and the government should keep an eye on the newly planted foliage to prevent wildfires in the future.

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