



Rediscovering Rivers in a Brazilian Megacity

by Douglas McRae



Virtual explorations of the rivers of São Paulo. Photo courtesy of Estudio Laborg.

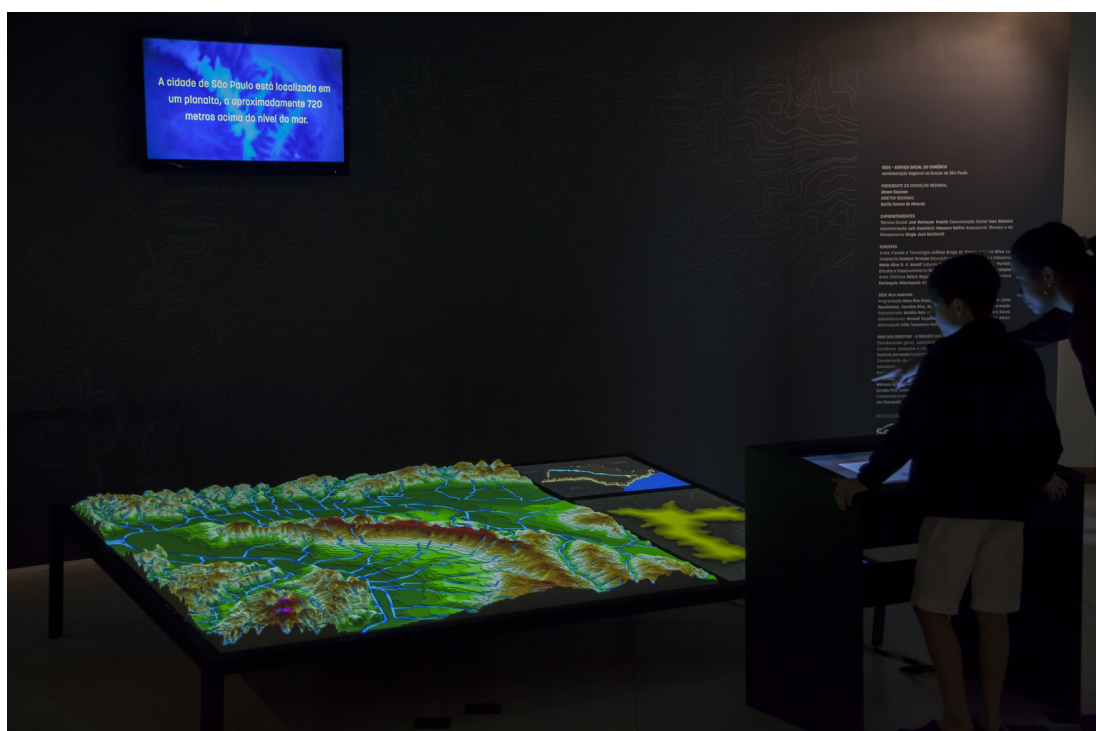
What is a watershed, and which one do you live in? When you turn on the faucet, where does that water come from? When that water runs down the drain or when you flush the toilet, where does it go? And when you see a rivulet of rainwater flowing in a gutter or hear the rushing sound of a fast-moving torrent under a manhole cover, is it just liquid runoff—or is it a river? Such questions often go unasked in modern city life, though they become more pressing in moments of scarcity (periods of drought) as well as overabundance (flooding). In São Paulo, Brazil, a collaborative installation between researchers and designers has sought to reignite these questions in the minds of their fellow Paulistanos, imparting a vision of the city's hydrological reality through an exhibition combining history, geography, ecology, and visual art.

São Paulo, like many large urban areas in the Americas, has a complicated, if not downright destructive relationship with its waterways. While visions of its rivers as a place of leisure, sport, and fishing exist in living memory, industrialization and demographic expansion have taken their toll over the past century. Additionally, water-related crises have manifested in several forms within the broader metropolitan region. Drought,

pollution, inadequate sewage management, and clandestine residential development into protected environmental areas have exacerbated underlying issues with the city's water infrastructure. Many rivers and streams have disappeared under pavement, or became congested drainage canals.

Since 2010, two researchers of São Paulo's rivers, geographer Luiz de Campos and architect José Bueno have coordinated the [Iniciativa Rios e Ruas](#) (Rivers and Roads Initiative), raising awareness of the city's forgotten rivers through educational and community activities. In addition to leading walking tours in neighborhoods around the city seeking to uncover its forgotten courses of water, Campos and Bueno also organize educational sessions with students, and in general raise awareness regarding aquatic nature in the city. Another important aspect of their work has involved "reclamation" activities: physically uncovering and rejuvenating submerged headwater springs of forgotten or hidden rivers and streams. "Even the smallest improvement makes a big difference," Campos told me in an interview, and such improvements can lead to the revival the plant and animal life in neighborhoods otherwise enveloped in concrete and asphalt.

In 2015, the year of a critical drought in São Paulo, a small design firm called [Estudio Laborg](#) contacted Campos about the possibility of collaborating on an installation reflecting the vision of Rios e Ruas. Alexandre Gonçalves and Charles Oliveira, the lead designers at Estudio Laborg, had started working together creating live abstract visualizations to accompany sets at electronic music festivals. Later, they applied their visualization skills towards creating projection-mapping installations, projecting bright, and at times psychedelic, animation onto historic structures in São Paulo's downtown area. Interest in the city's hydrological history led them to conceptualize an interactive map. "We realized that it would be necessary not only to gather data and measurements," says Gonçalves on developing the installation, "but also to adopt a pedagogical approach and a methodology."



The Rios des.cobertos exhibit, at the SESC Vila Mariana, photo courtesy of Estudio Laborg

The eclectic influences of Laborg's previous projects are evident in the stunning result, entitled "[Rios Descobertos](#)" (Rivers Un.covered, or Dis.covered). The exhibit consists of a 3D mapping projection over a scaled topographical model of São Paulo's central urban nucleus. By selecting programs on a touch-screen control panel, visitors to the exhibit project different neon-bright "masks" from the ceiling over the topographical model's rugged surface, displaying an animated bird's eye view of the core of Brazil's largest city and its underlying network of rivers. Audio effects recreate the sounds of the traffic-filled expressways or the downpour of summer storms, while a television monitor provides text narration for the selected program.

The exhibit has been hosted for over a year within city's network of [SESC](#) community centers, most recently in the Pinheiros neighborhood, west of the city center. The area shares its name with the Pinheiros River nearby, itself a tributary of the Tietê River that divides the center and northern areas of the municipality of São Paulo. In the middle decades of the past century, planners subjected both rivers to rectification, in an effort to stem flooding, promote lucrative real-estate development, and, in the case of the Pinheiros, reverse the river's flow in order to supply water to hydroelectric reservoirs in the extreme south of the city. The Pinheiros and the segment of the Tietê that passes through the metropolitan region today are putrid, highly contaminated from receiving the bulk of the city's mostly untreated sewage. The exhibit argues generally that the city's inhabitants have forgotten how to coexist with rivers. Only by recognizing the current imbalance can the city imagine a different ecological future.

The city of São Paulo, which traces its origins to the mid-sixteenth century, expanded from its initial point on a fortified hilltop across the surrounding plateau that encompasses the present-day metropolitan region, positioned between the tropical Atlantic coast and the fertile backlands of the Paulista West. The exhibit's topographical model throws into sharp relief the contrasts in heights between different levels of the modern city, ranging between 700 and 820 meters above sea level. Anybody who walks any long distance in central São Paulo realizes that the city is full of steep inclines, yet on this map the "Espigão Central" or central spine, clearly emerges as the most salient geographical feature, jutting up like a miniature mountain range. Avenida Paulista, one of the city's central axes, runs along the Espigão for several kilometers, marking the divisions between the river valleys that crisscross the plateau. These expanses of valleys contain rivers, each one of which subsequently flows towards várzeas (lowlands or floodplains) that drain into one of the three most prominent rivers: the Tamanduateí, Pinheiros, or Tietê.

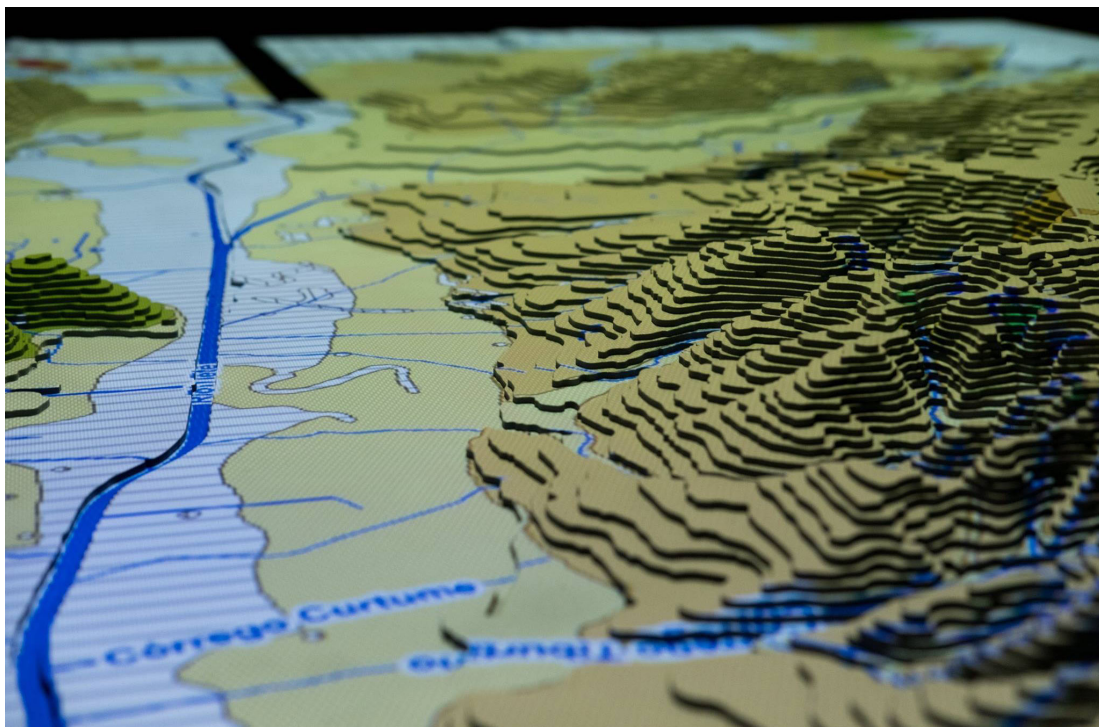


View of the Pinheiros River. Photo courtesy of the author

In designing their model, the designers ultimately recognized that they could only profile a segment of the municipality of São Paulo. “We had to choose one area of the city to represent,” says Gonçalves. “Depicting the entire municipality would impede the recognition of monuments and landmarks.” Additionally, part of the exhibit’s purpose was to emphasize the absence of rivers in the current cityscape—a reflection that they hoped the visiting public might take back to their own neighborhoods and cities.

In selecting a program on the control panel, visitors trigger an animation of this fluvial drainage in motion, illuminating the component parts that contribute to the Upper Tietê watershed, the region where the Tietê’s headwaters are located. The formerly sinuous curves of the Tietê and Pinheiros in particular vanish with the passage of time. Other rivers are highlighted: for example the Sapateiro River, which flows south of the Espigão into the Pinheiros, feeding the lakes in the city’s sprawling Ibirapuera Park. Another, the Verde River, is artificially split into two different courses, and occasionally causes massive floods in the lower areas of the Vila Madalena neighborhood. One can observe how the city developed at first bounded by these rivers, later growing over them and causing them to fade from both sight and mind. Campos often reminds audiences that Paulistanos are rarely more than 300 meters from the course of a river. “Most Paulistanos have a vision of a city with three or four rivers” Campos explains, when in fact, any stream of water above or below ground can signify a forgotten river.

Each layer of the topographical model was meticulously cut and stacked by Laborg designers, scaled in a way that generates a uniform projection while maintaining a realistic visual representation. Toggling between different overlays, one may simultaneously project micro-watersheds over modern neighborhoods, streets along hidden streams—many of which have been converted into underground channels yet still share the same name with the street or neighborhood that covers them. The process of building this model was not just a process of consulting [maps](#) and [digital databases](#), though these were key. On their walking tours, Campos and Bueno seek out long-time residents of what were once suburban, even semi-rural areas earlier in the previous century. These informants tell stories about the rivers that once ran right outside their doorways. Bueno emphasized in a recent talk that often those who live beside rivers are the ones who best understand them. Working with historian Silvana Jeha, who wrote the exhibit’s texts, the team sought to re-signify the city’s geography, synthesizing the vast if diffuse aquatic memory of the city.



Detail view of the different levels of the model, each step representing five meters.

Photo courtesy of Estudio Laborg.

Urban history and memory are also inscribed on the landscape model of the exhibit. Visitors can trace the paths of the roads that radiated out from São Paulo, connecting the colonial town to the current Brazilian city. Bridges facilitated movement between agricultural communities on the outskirts of the nineteenth centuries, while fountains supplied water from a series of precarious tanks and reservoirs. Pointing out these landmarks, many of which no longer exist, reinforces the idea that something has been lost, as the city has become more alienated from its water sources.

That could change, and the creators of Rios Des.cobertos are optimistic. “Change will definitely take place” says Campos, “and our work with Laborg will help bring that change more quickly.” (The team is also developing a similar exposition to be circulated in towns located in the Middle Tietê watershed, downstream from São Paulo.) Visitors, from retirees to practicing civil engineers have provided further information after visiting the exhibit, while younger generations have recorded their amazement in the exhibit’s guestbook, displaying a new awareness of their city. Rios Des.cobertos challenges visitors to take another look at the cities we inhabit, not just to reflect wistfully on the vanishing of historical landscapes, but to imagine how a city might start to restore some semblance of balance with its rivers.

Douglas McRae is a PhD candidate in History at Georgetown University, where he also earned an MA in Latin American Studies. He was the recipient of a Fulbright study and research grant in 2017 to research the environmental and social history of urban water and sanitation services in São Paulo, Brazil.