

The Little River that Could: Tampa's Hillsborough River

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Introduction

At first glance, Tampa's Hillsborough River is not much of a stream. From its headwaters in central Florida's Green Swamp to Tampa Bay, it barely stretches 54 miles. Too small and too short, it supports virtually no waterborne commerce unless you count the college crew teams that have been plying the waters near its mouth into Tampa Bay each winter for more than 60 years (personal conversation with Tampa Bay historian Rodney Kite-Powell). Interstate highway 275 near downtown Tampa does not even sport a sign telling drivers that they are crossing the river, which hardly matters because the river cannot be seen from the road. Indeed, for decades Tampa's developers ignored the Hillsborough, essentially shunning this hidden gem much like Cinderella's step sisters, who looked down upon a budding princess in their midst. Like Cinderella, however, this scrawny, barely noticed, subtropical stream has long been a workhorse and probably deserves more attention than it receives, for it is on the verge of coming out of Tampa's shadows.

Despite its diminutive stature, the Hillsborough is essentially three separate streams rolled into one: the wild and scenic, mostly spring-fed headwaters portion; the suburban stretch that strains to provide Tampa drinking water and recreational boating; and the mostly privatized, neglected, and concrete-banked urban reach (Figure 1). Many large U.S. cities grew up on the banks of rivers and their stories are often well documented: the iconic Mississippi River bisects the twin cities of Minneapolis and St. Paul, serves as the spirit of St. Louis, and gives Memphis and New Orleans the blues. Who could imagine New York without the Hudson River, or Pittsburgh, Cincinnati, or Louisville shorn of the Ohio River? Further west, the Columbia River is to Portland what the Arkansas River is to Tulsa. Even the modest Miami and Los Angeles Rivers, one formerly relieving the Everglades of excess water and the other covered in concrete, are inseparable from their respective cities. This paper is a regional geography of a little known river in a major North American city. Regional geography has seen better days, its heyday passing more than a half century ago. Yet I contend that a classic, historical and regional approach to analyzing this river is the best way to reveal its potential as a source of water, recreation, and commerce. Geographers will recognize the major themes of water resources, sense of place, ecotourism and urban planning and development.

Hillsborough River and Tampa By-Pass Canal

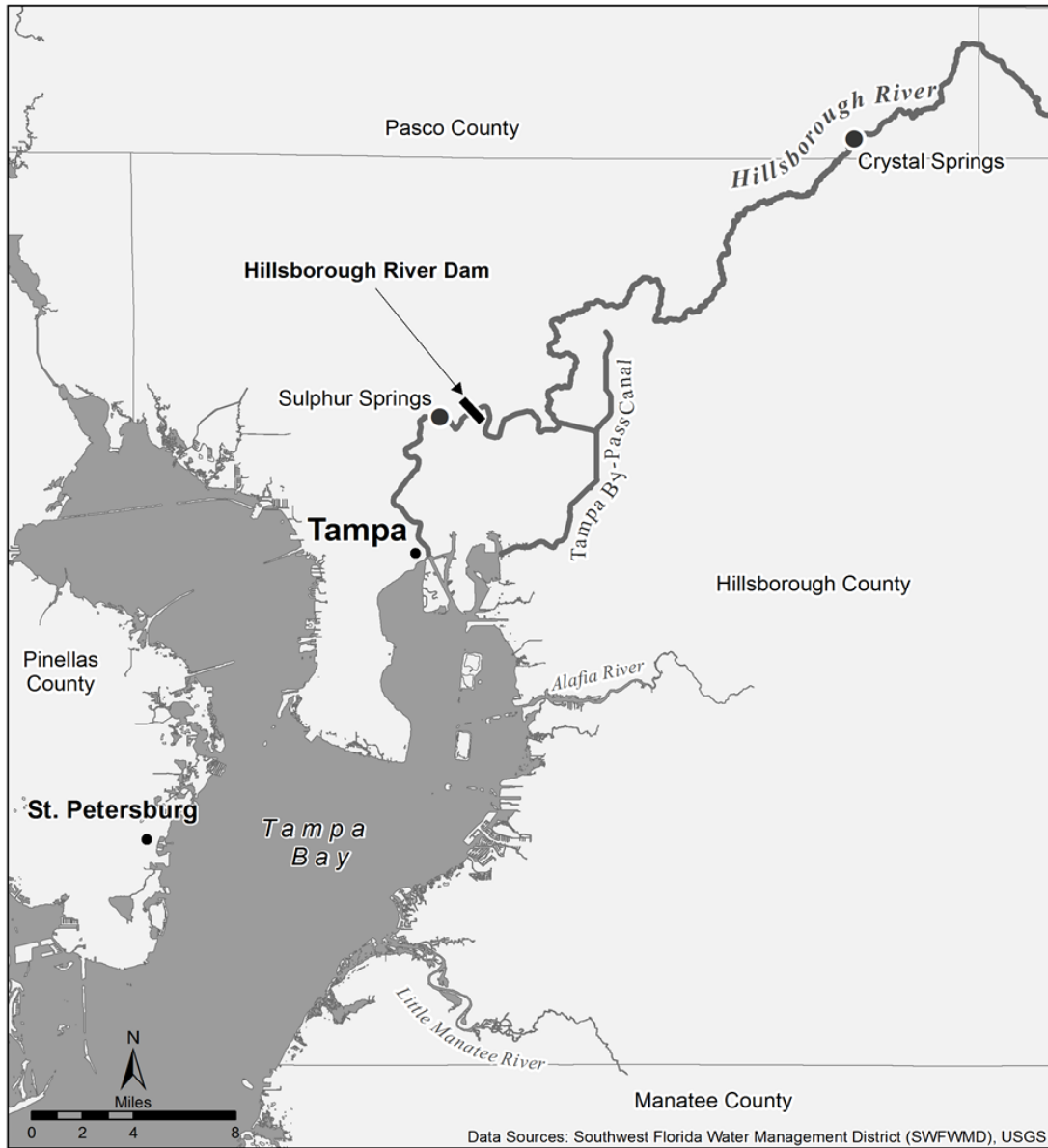


Figure 1. Tampa, Florida; the Hillsborough River, and the Tampa By-pass Canal. Map by Andy Hayslip.

Geoscientists have discovered that the Hillsborough River used to be longer than it is today. According to University of South Florida geological oceanographer Al Hine (personal conversation), during the most recent Ice Age, sea levels were about 400 feet lower than those of today and Florida's climate was much drier. As the last ice age ended and Florida's climate became more humid, drainage from the Tampa area (including what we now call the Hillsborough River) flowed into a lake in Tampa Bay (which was high and dry some 20,000 years ago). Overflow from this lake, in turn, ran perhaps as many as a dozen miles out on to the exposed continental shelf before probably pouring into a sinkhole. As glaciers around the world

continued to melt, sea level rose, eventually drowning this extension of the Hillsborough River and what is now Tampa Bay.

The Hillsborough River was probably not charted or surveyed by Europeans until after a group of Spaniards paddled up river in 1757. According to Gloria Jahoda (1973, p.81), “Exactly who it was that turned the River San Julian de Arriaga into the Hillsborough is unknown, but the name Hillsborough appears on a British map of 1769 by Thomas Jeffries.” The river had been known by a series of different names prior to the later 1700s, when British colonial authorities gave a portion of Tampa Bay, the river, and ultimately Hillsborough County, their current names—honoring Wills Hills (the Earl of Hillsborough), an eighteenth century secretary of state for the English colonies (Morris, 1995). Rising less than a dozen miles beyond Hillsborough County, the river drains a subtropical region of more than 700 square miles (Figure 2) that generally receives around 50 inches of rainfall per year. During much of the summer rainy season (Figure 3), the upper Hillsborough is fed by springs and by overflow from the nearby Withlacoochee River. Otherwise, the river is fed by modest drainage oozing from the Green Swamp; a host of smaller, tributary creeks; storm water runoff from Tampa and its suburbs; and perhaps most important: Crystal Springs.

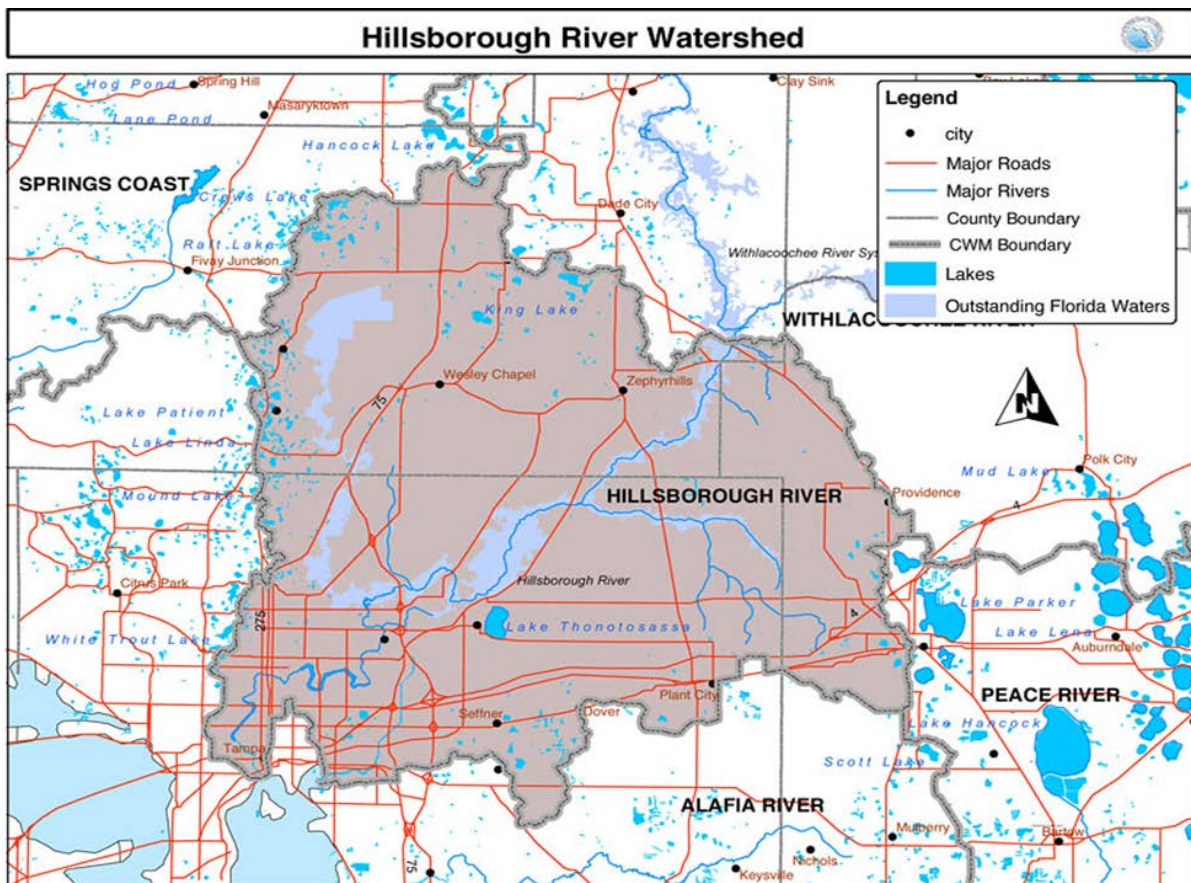


Figure 2. Map of Hillsborough River Watershed. Note that the Hillsborough rises very close to the Withlacoochee River. Source: Southwest Florida Water Management District.

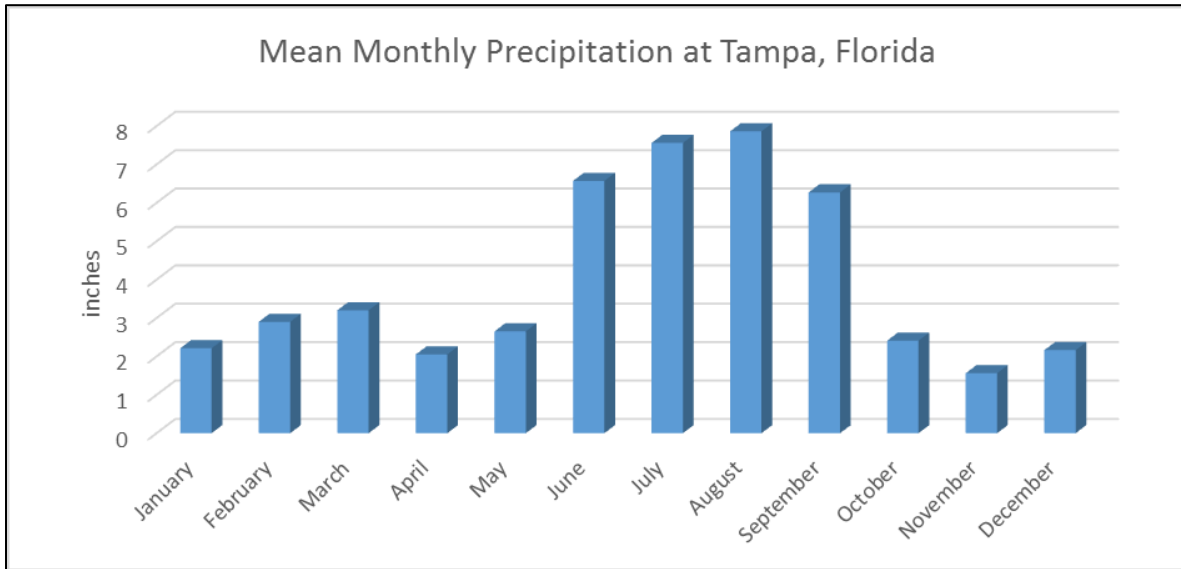


Figure 3. Tampa’s precipitation displays a clear seasonal pattern: rainy summers and much less rainy the rest of the year.

Wild and Scenic Headwaters

The Hillsborough begins in southeastern Pasco County, at the edge of the Green Swamp. Paddling this far up river is to go back in time: there is virtually no development here. During the rainy season, water covers the landscape and the channel is lost in a labyrinth of cypress and other flood tolerant trees. For most of its first several miles, the river is embedded in a broad floodplain flanked by swamps, which yield tannic acids—a product of significant but natural organic matter decomposition that gives the water the color of iced tea. Less than 50 miles from Tampa, one can become hopelessly lost in the delicious scenery (Figure 4).



Figure 4. Part of the Hillsborough River headwaters. Photo by author.

Less than 10 miles from its headwaters, but still (barely) inside Pasco County, the Hillsborough is greatly aided by Crystal Springs, a second magnitude spring group discharging an average of 30 million gallons of bluish clear water into the adjacent river every day (Crystal Springs Preserve, n.d.; Figure 5). The springs used to be run as a private recreation area, and for decades it served as a popular swimming hole. Yet in 1996, rancher Robert Thomas—who owns 525 acres surrounding the springs—closed the recreation area because he said the area suffered from decades of overuse. Indeed, he planned to restore the property and open an environmental education center. At the same time, Thomas applied to increase his pumping of spring water from 301,000 gallons per day to 1.8 million gallons per day, in order to increase his sales to Nestle, which bottles the water under the Zephyrhills label. In Florida, all water users are required to obtain a consumptive use permit, in this case from the Southwest Florida Water Management District (sometimes referred to as Swiftmud) but they do not have to pay anything for the water they extract.



Figure 5: Crystal Springs. Photo courtesy of Nestle.

This includes water bottlers (or land owners such as Thomas who sell water to corporations like Nestle), who make millions of dollars annually extracting water to sell back to the public at greatly inflated prices. Local environmentalists expressed outrage over the permit application; the water management district ultimately negotiated a deal in which they permitted Thomas to extract up to 755,000 gallons per day if he would invest more in an environmental education center adjacent to the springs, which he did. Moreover, less than 3% of the spring's flow is extracted for bottling.

Swollen by the discharge from Crystal Springs, and by additional surface water from Blackwater Creek, the Hillsborough then descends through class II rapids in Hillsborough River State Park (Figure 6). These are hardly the famed Colorado River rapids shot by John Wesley Powell in 1869 (class VI rapids are the most dangerous); the only real danger on the Hillsborough River rapids is getting stuck on the rocks in relatively shallow water. With the help of the Depression era Civilian Conservation Corps (CCC), Florida opened Hillsborough River State Park in the 1930s, and visitors can now walk across the river on a suspension bridge built by the CCC (Figure 7). It is hard to imagine this park is just 23 miles from downtown Tampa—except that more than 192,000 people visited Hillsborough River State Park in 2013; this is up from nearly 150,000 visitors in 2010 (personal conversation on 17 March 2014 with Maria Leffler, Florida Department of Environmental Protection). Clearly, the region makes heavy use of this wonderful place.



Figure 6: Hillsborough River rapids. Photo by the author.



Figure 7: The CCC suspension bridge over the Hillsborough River in Hillsborough River State Park. Photo from Hillsborough River State Park web site (<http://www.floridastateparks.org/HILLSBOROUGHRIVER/DEFAULT.cfm>).

After passing the state park, the Hillsborough wiggles through several more miles of woods, swamps, and lightly settled land northwest of Tampa before finally passing near the University of South Florida and continuing its journey through suburban Tampa.

Middle Hillsborough River and Water Resources

The river's middle section now provides modest recreational opportunities for the many homeowners fortunate to live along its banks, but this was not always the case. When the local electric company first built a dam on the Hillsborough River in 1897, local cattle ranchers objected to losing some of their pasture, so they used dynamite to blow up the dam. Although 90% of Florida's drinking water comes from the ground (Marella 2009), early 20th century Tampa wells produced groundwater containing too many salts and minerals, so the city built a new water facility in 1926, relying upon the Hillsborough River for drinking water. The City of Tampa completed construction on the current Hillsborough River dam in 1944 (Figure 8), which creates a surface reservoir that supplies much of Tampa's drinking water.



Figure 8. The City of Tampa's dam on the Hillsborough River. Photo by author.

Like virtually every river, the Hillsborough occasionally receives far more water than it can carry, so it has a history of devastating floods. Particularly damaging floods occurred in 1921, 1933, 1934, 1935, 1945, 1947, 1959, and 1960 (SWFWMD 2000; Foley 2007). The flooding caused by Hurricane Donna in 1960 was the last straw. It did not help that the headwaters region of the Hillsborough River had near record rainfall and significant flooding in March 1960; but toward the end of the summer rainy season in September, Hurricane Donna passed just east of Tampa (Barnes 2007), helping make this month one of the rainiest on record at Hillsborough

River State Park (Table 1). The Florida Legislature responded by creating the Southwest Florida Water Management District in 1961, a regional agency to operate flood control works (such as the Tampa by-pass canal in Figure 9) designed and built by the U.S. Army Corps of Engineers.

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>Aug</u>	<u>Sept</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>TOTAL</u>
2.83	2.92	3.68	2.34	3.39	7.93	8.16	8.29	7.37	2.89	1.98	2.53	54.31 (mean)
1.88	4.71	12.48	3.42	1.61	5.78	13.83	2.38	17.78	2.18	0.0	1.89	67.94 (1960)

Table 1. Average monthly precipitation compared to monthly precipitation in 1960 at Hillsborough River State Park. Data source: The Southeast Regional Climate Center.

http://www.sercc.com/climateinfo/historical/historical_fl.html

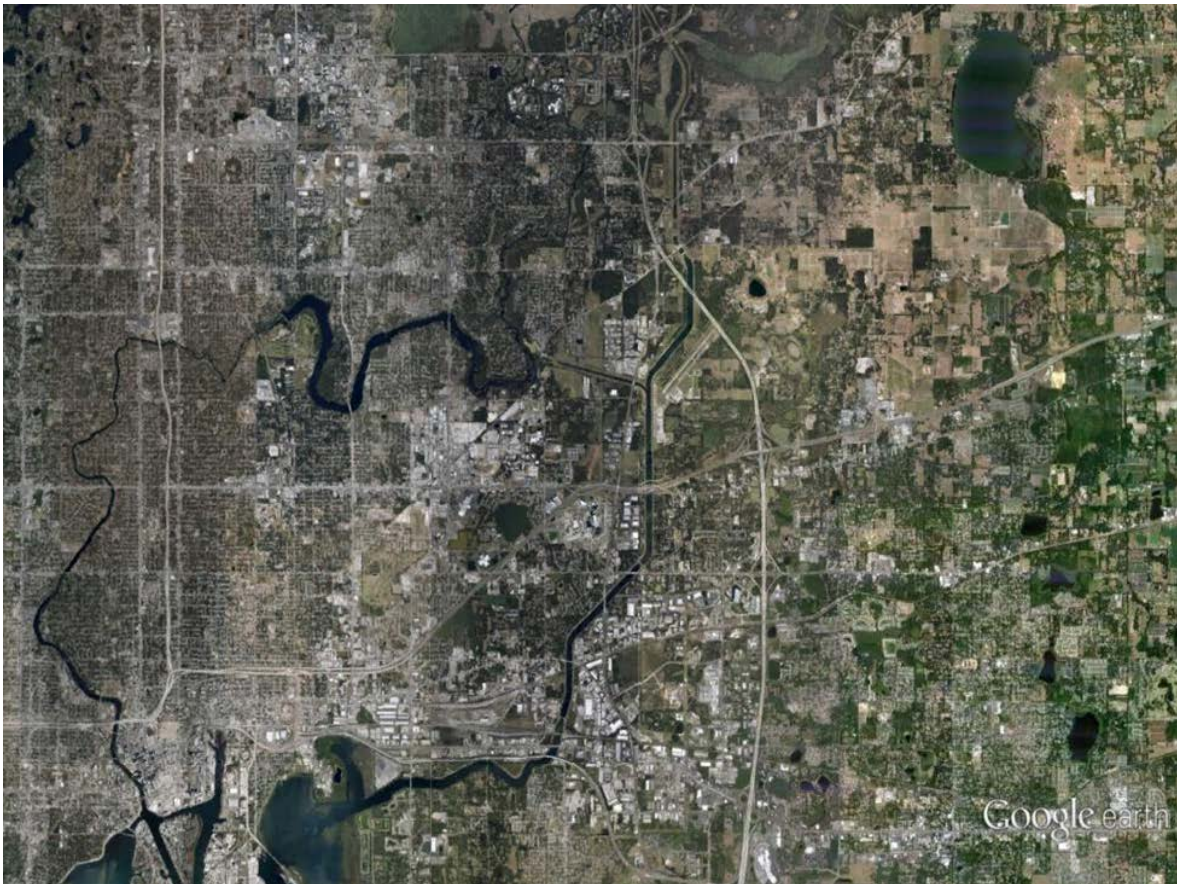


Figure 9. The Hillsborough River runs along the top left of this Google earth image before turning south toward downtown Tampa, lower left. The “thick portion” of the river near the top of the image is the river reservoir created by the city’s dam. The Tampa by-pass canal (dug in the 1960s and 1970s to remove Hillsborough River flood waters) runs down the middle of the image. Image from Google Earth.

From a water resources perspective, it is important to keep in mind that the Tampa Bay area features a humid subtropical climate with mean high temperatures during long, hot summer days in the low 90s (F); and mean high temperatures during winter afternoons in the low 70s (F).

Average annual precipitation at the Tampa airport is just 47 inches, but this location is less than a mile from Tampa Bay and not in the Hillsborough River watershed. Further inland, near the headwaters of the Hillsborough River (at Hillsborough River State Park), average annual precipitation exceeds 54 inches. At the same time, keep in mind that evapotranspiration in the region is roughly 39 inches of moisture per year.

In a typical year, the Hillsborough River supplies all the water Tampa needs from early June to January. Yet from January to June, after the previous summer's heavy rains have worked their way through the watershed, the river is no longer able to supply all the water Tampa demands. During the week of 14-20 April 2013, for example, the Hillsborough River/Reservoir provided Tampa just over 52% of Tampa's water supply (City of Tampa 2013). Where does the additional water come from? The short answer is two alternative sources: the Tampa By-pass Canal (TBC) and aquifer storage and recovery (ASR) wells.

During the rainy season, the Tampa By-pass Canal ushers excess water away from the Hillsborough River and into Tampa Bay. Although water managers originally designed the TBC to prevent river flooding, engineers accidentally dug the canal a bit too deep and punctured the Floridan aquifer—so copious amounts of fresh water bubble to the surface in parts of the canal throughout the year (essentially creating a spring!). Accordingly, toward the end of the dry season (April through May) TBC water usually augments the Hillsborough River/Reservoir. For example, during the week of 14-20 April 2013 (City of Tampa 2013), the Tampa By-pass Canal provided more than 35% of Tampa's potable water supply.

Toward the end of the dry season, Tampa also relies on water withdrawn from aquifer storage and recovery (ASR) wells. During the rainy summer months, water managers force-feed excess freshwater from the surface into the aquifer for storage until it is needed during the dry season. During the week of 14-20 April 2013 (City of Tampa 2013), ASR wells contributed 12% of the city's water supply.

Lower Hillsborough River and Economic Growth in Downtown Tampa

From the City of Tampa's dam, the Hillsborough River snakes another eight miles or so through mostly residential neighborhoods on its way to downtown Tampa. By the 1970s, Tampa had grown to the point where it needed virtually all of the Hillsborough's water during the dry season, and in recent years—the river often cannot provide nearly enough water for the City of Tampa. Accordingly, since the 1970s, during the dry season, the city often allows little or no water to dribble past its dam in late spring; this leaves the lower river heavily influenced by (low quality) urban storm water runoff and daily tides pushing salt water upriver. This, in turn, causes problems for estuarine species that attempt to migrate up the Hillsborough seeking refuge in fresh water for a crucial part of their life cycle. According to Montagna et al. (2007, p. 3-4), "Estuarine nursery habitats must . . . have salinities low enough to provide protection from marine predators, parasites, and disease organisms (Overstreet 1978). . . . This is another important reason why the young of so many coastal marine fishery species are adapted to migrate inshore and up the estuary to low salinity nursery habitats."

Chapter 383 of the Florida Statutes demands that the state's five water management districts (Figure 10) establish minimum flows and levels for all water bodies in order to protect these resources from significant harm (a problematic phrase that is usually dealt with by examining the biota that should appear in particular water resources). In 1999, the Southwest Florida Water Management District demanded a minimum freshwater flow of 10 cubic feet per second (cfs) (or 6.46 million gallons per day—mgd) for the Lower Hillsborough River (including that portion from the base of Tampa's dam). After studying the matter further (SWFWMD 2006; Montanga et al. 2007), in 2007, the District approved a revised minimum freshwater flow in the Lower Hillsborough of 20 cfs (12.9 mgd) from July through March, and a 24 cfs (15.5 mgd) minimum flow from April through June, a critical time for several estuarine species seeking freshwater (Florida Administrative Code, 40D-8.041). Yet even this is not the end of it.

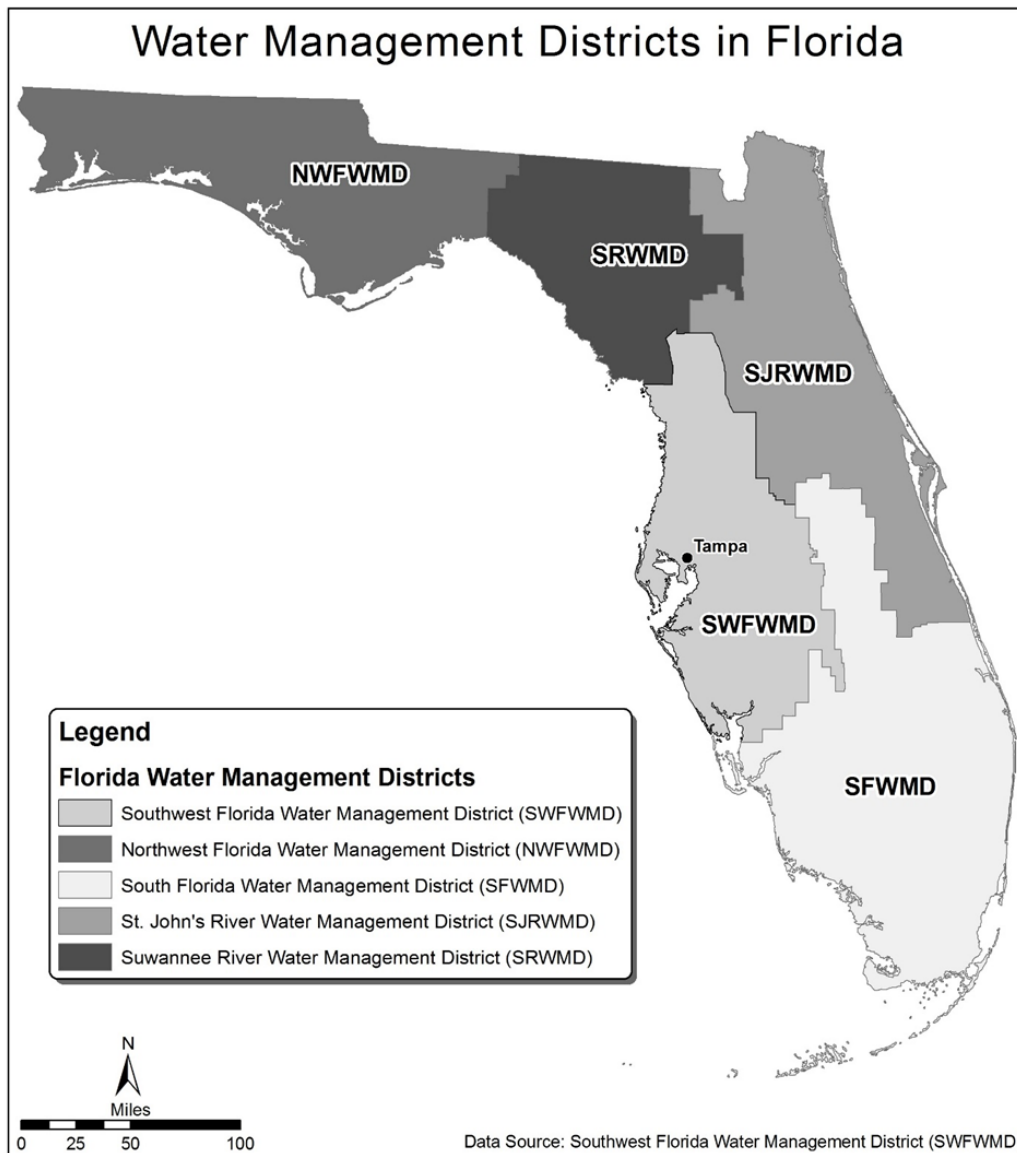


Figure 10. Florida's five water management districts. Map by Andy Hayslip.

As it happens, Hillsborough River Reservoir water suffers from excessive nutrients (mostly from excessive lawn fertilizing), which stimulate excessive algae growth; and then the bacteria that decompose dead algae consume much of the dissolved oxygen in the water. If authorities release more water from the dam to reduce salinities immediately downstream, this may not help estuarine biota who might find sufficient freshwater with insufficient oxygen. Desperate to solve the problem, water managers have turned to an unlikely, alternative source of freshwater: and urban spring.

A little more than two miles downstream of the dam, the Hillsborough River picks up flow from Sulphur Spring. The spring was a popular swimming hole for much of the twentieth century, but the City of Tampa had no choice but to close the spring to swimming in 1986 after bacteria counts became too high (Figure 11). As it happens, Sulphur Spring is fed by surface water seeping directly into the soil and by urban runoff into several partially clogged sinkholes that funnel surface water toward the spring, which has an average discharge rate of 34 cfs (22 mgd; SWFWMD 2004). More than a decade ago, Tampa officials investigated the possibility of unplugging the clogged sinkhole/ponds to allow more rapid flow of water to Sulphur Spring, but these officials ultimately found that this would not be economically feasible (Pittman 2012). The City of Tampa now has a water use permit to pump an average of 5 mgd (and a maximum of 20 mgd) of spring water back upriver to the base of the dam, where it is released into the lower Hillsborough River—providing badly needed, relatively low nutrient water for estuarine species.



Figure 11. Tampa’s Sulphur Spring. Note the fence preventing access. Photo by author.

From Sulphur Spring, the Hillsborough River meanders another several miles through mostly residential areas (Figure 12) into downtown Tampa and ultimately Tampa Bay. For much of the twentieth century, the city of Tampa paid little attention to the Hillsborough River. From the 1880s until after World War II, the riverfront near downtown featured a ramshackle collection of

unattractive industrial and commercial land uses. This made the river almost invisible to anybody who did not work on its banks; not that many people had any interest in the polluted and mostly foul smelling lower Hillsborough. As happened in many American cities during the 1960s and 1970s, hoards of downtown residents and businesses fled to new and attractive suburbs. The University of Tampa, occupying the historic Tampa Bay Hotel on west bank of the river opposite downtown, must have felt abandoned (Figure 13). Yet thanks in part to the water quality improvements demanded by the 1972 Clean Water Act, the Hillsborough River slowly began to recover and attract Tampa's attention. For the next 30 years, a succession of Tampa mayors and city officials cut ribbons on a handful of modest projects intended to encourage public interaction with the river, but these efforts remained isolated in time and space. Of course, gentrification of the riverfront (in Tampa as elsewhere) requires significant and sustained public and private investment as well as public support. Yet until recently, after each project, riverfront redevelopment efforts quickly dissipated (see <http://www.thetampariverwalk.com/about-us/history.aspx> for a list of riverfront improvement projects).



Figure 12. The lower Hillsborough River, just downstream from Sulphur Spring (but still several miles north of downtown Tampa), is dominated by residential development. Photo by author.



Figure 13. The downtown portion of the Hillsborough River as seen from the river’s west bank at the University of Tampa. Photo by author.

Soon after her inauguration as Mayor of Tampa in 2003, Pam Iorio made downtown re-development a priority, and she supported a renewed focus on the riverfront. To this end, she called for the development of a Tampa Riverwalk Master Plan (EDAW, Inc. 2006); she made full-time city staffer Lee Hoffman responsible for implementing the plan, and she also pushed for the creation of Friends of the Riverwalk, a non-profit 501 (c) (3) organization to oversee plan implementation and build public support. According to the master plan creators, “The Tampa Riverwalk will consist of approximately 2.4 miles of a 15-foot wide walkway along the east side of the Hillsborough River from the North Boulevard Bridge south to the Tampa Convention Center and continuing along the north side of the Garrison Channel to the Channelside area” (EDAW, Inc., 2006, p. 9). Of course, the idea is to attract people to the waterfront by crafting a pleasant environment complete with opportunities for recreation, shopping, dining, public art and other cultural events—similar to the development along the River Walk in San Antonio, Texas.

According to Lee Hoffman (personal conversation), about 85% of Tampa’s Riverwalk will be complete by the end of 2014, and remaining elements will likely be finished over the next two or three years. Hoffman confesses that city officials originally hoped that the costs would be split 50/50 between public and private sources—but the reality is that federal and state grants as well as city money have provided about 90% of the funding. Still, Hoffman credits downtown

business interests for their cooperation on critical projects. Indeed, now that the downtown Tampa Riverwalk is nearly complete, city officials recently unveiled the West River Redevelopment Master Plan (Wiatrowski 2014), intended to extend the redevelopment process immediately north of downtown in a poverty stricken area dominated by aging and inadequate public housing projects.

Conclusion

The Hillsborough River is primed to play a greater role than ever in the lives of many Tampa Bay area residents. The middle Hillsborough is already providing all the water and recreation it can; and it is no longer flood-prone. Yet as the bay area continues to grow and open space disappears, the river's headwaters region (including Hillsborough River State Park) will serve ever more people who want to experience what many natives call "the real Florida"; places where people can experience landscapes much less altered by humanity. The long-neglected lower Hillsborough, particularly that portion passing through downtown Tampa, is now primed to reclaim its position as the heart of Tampa. Thoughtful redevelopment efforts, grounded in data analysis and community outreach, are well under way. Downtown Tampa is slowly building a reputation as a place to spend time away of work.

Indeed, the Humanities Institute at the University of South Florida sponsored a two and a half week long series of events in late 2012 called The Hillsborough River: Human Connections. Events included rallies and river clean-ups, public lectures and panel discussions featuring a host of different perspectives, as well as displays of breathtaking photography and other art work. Much of this activity is captured on the web at <http://hillsborough-river-connection.org/>. Tampa is one of the few major North American cities that have a river few people (even Tampa natives) know much about. The Hillsborough River is only 54 miles long, but it is on the verge of finally becoming the heart of Tampa.

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