

## ***The Secret Watershed: Restoring history & nature in a lost landscape***

By Cynthia Barnett

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Last fall, a new exotic species was discovered in Sarasota, its invasion pathway the Gulf of Mexico. Classification, taxonomy and native country were not immediately known. But its appearance served as a profound reminder of the fast-closing distance between a once-sheltered watershed and an unbound globe.



I am speaking, of course, of the yellow-headed Lego Man that appeared along the shoreline at Siesta Key in October. The eight-foot-tall publicity stunt did not impress your art critics: Joan Altabe dismissed it as “shallowness” with “nothing behind it.”

But the shallow block man captured the imagination of your community with remarkable spark and connected you to each other and the rest of the globe with remarkable speed. The *Los Angeles Times*, *London Sunday Telegraph*, *South China Morning Post*, *Windsor Star* of Ontario and *Evening Standard* of North New Zealand all made a splash over Sarasota and the Lego Man, whose pop-art parentage was quickly linked to the Netherlands.

When you think about it, no other topic involving the Sarasota Bay Watershed in 2011 sparked the frenzied interest of as many local residents and had as global reach.

As we gather for three days’ exploration of watersheds – including the Bay and its fluid interdependence with 50,000 land acres of Manatee and Sarasota counties, with the estuaries and the Gulf, with the largest tributaries and the smallest swales, it is tempting to lament the lack of connection between people and their water: Oh, if only the culture could be as captivated by the fate of the watershed, as intrigued by its mysteries, as by pop-art Lego Man’s.

But we must understand that for most Floridians, and most Americans, the watershed is a well-hidden secret. This is not a matter of ignorance; the communities in this watershed are among the best-educated in Florida, the most ecologically aware and the most conscientious.

This is clear from the region's rich conservation history ... to its model water-use ordinances ... to the enormous effort and payoff eliminating wastewater runoff into Sarasota Bay.

Rather, we lack the wisdom of watersheds because for 150 years, we've been taught that water is properly divided into parts: Bayfront tamed by sea walls; potable water in tanks for drinking; stormwater ponds behind chain-link fences; isolated fake wetlands stranded in highway medians; rainwater wicked off urban landscapes and into concrete gutters and drains.

In the 19<sup>th</sup> Century, we had historic memory for watersheds. In the 20<sup>th</sup> Century we erased it – wetland by wetland, raindrop by raindrop. This conference is about restoring that memory. Wetland by wetland, raindrop by raindrop, in the 21<sup>st</sup> Century, we are going to get it back.

Next year, our state marks the five-hundredth anniversary of the arrival of another exotic European man, Juan Ponce de Leon, on the shores of what he thought was an island and christened *La Florida*. Returning eight years later on this side of the peninsula, Juan Ponce found no fortune. Quite the opposite, he took a deadly arrow to his thigh – the tip poisoned with the sap of a manchineel tree.

Among the Spanish explorers who followed in this region, some were so blind to the watershed that they spent much of the time hungry – sometimes starving and sometimes resorting to cannibalism – in plain view of the protein-packed estuaries and bays that had sustained the Calusa and other native people here for centuries.

Southwest Florida was wet, remote and inhospitable enough that permanent settlement would take over three hundred years more. Government fish surveyors writing in the 1880s described the land fronting Sarasota Bay as heavily wooded, with pines foresting the mainland and thick mangrove swamps dominating the shore. Early pioneers spent decades working to turn tangled jungles to neat farms and what must have been one of the most beautiful frontier outposts in the nation, with intimate connection to Sarasota Bay.

In the 1920s, as other farmers and ranchers, then real-estate speculators, saw the water and land could be divided and conquered, they began large-scale drainage. The era's land boom set dredges working overtime in southeast Florida.

But they found steady commission on the southwest coast as well. Eventually, they would drain 100,000 acres of freshwater marsh from Tampa Bay to Charlotte Harbor.

As dredges and drills worked to build up modern agriculture and modern cities, every scoop, every rotation, helped to sever the region's still-small population physically from water, until people surrounded by water were no longer living with water. Mangroves flattened. Wetlands drained. Sea walls carefully erected between people and Bay. Groundwater pumped up from an

invisible aquifer, into invisible pipes, to magically quench the new homes and the new businesses. Another invisible set of pipes, lay to an invisible destination, to carry wastewater away.

Those last two feats were the great scientific achievement of the 20<sup>th</sup> Century, one that saved countless lives. But very soon, these and other water achievements became water entitlements.

When we hand-pumped water for drinking or relied on a stream to run a grist mill, we understood the concept of a watershed. Even the littlest members of families knew that water was worth its weight in gold – because they're the ones who had to lug it in buckets. But now, Floridians – and Americans – began to lose all concept of the watershed they lived in, where their house water came from, or where it went after they flushed. A new invention called the lawn sprinkler even made irrelevant the rain. By the 1920s you could already find one crafted as an alligator, a cannon, or an 18-pound tractor.

When the big growth boom hit post-World War II, increasingly intense coastal development further separated Floridians from their watershed, further trained the burgeoning population to think of water in individual and sterile parts rather than a living whole. From the 1950s and through the early 1970s, developers dug up hundreds of acres of Florida's bays to create waterfront lots. They dredged canals and used the spoil to devise subdivisions. They drained saltwater marshes to improvise residential neighborhoods. Pictured here is infamous Cape Coral, but no southern coastal counties were immune to such Water Wonderlands.

Those big things represented the physical separation; a million little things added up to the psychological one. Inside the new neighborhoods, miles of curbs and gutters were built to wash away any evidence of rain. Large home lots, disposable incomes and a nifty concrete spray called gunite harkened the backyard swimming pool. Chlorinated waters earned elevated status over natural ones.

Perhaps no local story better illustrates the physical and psychological break between people and watershed than the rerouting of Highway 41 along Sarasota Bay. Pre-'50s, the Bay was organically connected to downtown. The post-war boom choked inland highways. The old road department decided to four-lane them and create a bypass for U.S. 41 along Bayfront Drive. City leaders liked the concept. It would expose out-of-towners to the incredible waterfront vista.

Dredge and fill work began in 1958. In the early 1960s, with City Hall stranded on a desert isle of fill, the community debated what would be most important for this space between downtown and Sarasota Bay. Despite efforts to make human connections, the dominant use of the space is asphalt surface parking.

Paul Rudolph, by then dean of the Yale School of Architecture, foretold the grave mistake of separating the city from its greatest asset – the glittering Bayfront. New urbanist architect Andres Duany has underscored that criticism for a dozen years since taking on the city's

downtown master plan – urging Sarasotans to recover a lost opportunity for the Bayfront to define the city as powerfully as waterfronts define Cannes, Monte Carlo, Portofino and Lucerne.

The illustrious architects were right about the Bay. But they, too, missed the larger blueprint. And that is the watershed itself.

The culture already holds deep reverence for the masterpieces of the watershed. The Bay and the Gulf already define this place every bit as much as the Mediterranean to Monte Carlo. What we fail to appreciate is the larger collection: The rainfall and the rivers, the smaller bays and the sloughs, the tributaries and the tidal streams.

Indeed, our blindness to the watershed is an aesthetic not unlike the modernist art of the era: A rejection of organic harmony in favor of the abstract. Our 20<sup>th</sup> Century approach to water trained our eyes on right angles over the broad brushstrokes of natural shorelines. The resulting system of straight-edge shores, drains and ditches, pumps and pipes is worthy of a Rube Goldberg cartoon. Tellingly, the Pulitzer Prize-winning artist began his career as an engineer with San Francisco's water and sewer department.

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Modernism empowered artists to approach their subjects in bold new ways. But the approach to water that I'll call the Modern Water Age began to show its cracks almost immediately. Wiping out wetlands meant we wiped out our storehouses for freshwater, safe houses for flood water. Paving over recharge areas actually helped dry up our afternoon rains. Over-pumping groundwater created man-made scarcity in one of the wettest states.

Southeast Florida became a national poster child for the unintended consequences of the Modern Water Age. Today, communities facing water scarcity there are working to figure out costly alternative-supply strategies to bring freshwater IN, as the Goldberg-esque Everglades plumbing system drains out an average 1.7 billion gallons of freshwater every day to keep the whole place dry.

Locally, chronic flooding on barrier islands including St. Armands Key reveals the illusion of making rainfall disappear in coastal areas with low elevation and high tides. Taxpayers have spent \$5 million for five lift stations to pump stormwater out of the barrier island's streets and into the Gulf during heavy rains and high tides, along with emergency generators to power the stations during electrical outages.

But that solution is straight out of the Modern Water Age. It relies on high-cost, energy-intense technology that may or may not work in our climate-changed future. It does little to restore the watershed – or our human connection to it.

Statewide and nationally, the last time ordinary citizens got fired up about their water was in the early 1970s. The federal and Florida governments tackled some of the most damaging consequences of the Modern Water Age. Nationally, we put the brakes on big dams and created the Clean Water Act, the Environmental Protection Agency and other safeguards.

Florida's ethos for natural resources began to shift from 'commodity' to 'treasure,' in the words of Bob Graham, then a young lawmaker in the Governor Askew era working hand-in-hand with Republicans such as Warren Henderson of Sarasota to create protections including our water-management districts.

This might be seen as the beginning of the Ethical Water Age. Although, as we celebrate the 40<sup>th</sup> anniversary this year of Florida's water management districts and the U.S. Clean Water Act, it is clear that four decades has not been long enough to make the transition.

Historians often call Rachel Carson's *Silent Spring*, published in 1962, the catalyst that inspired citizens to demand these environmental protections. But they put an asterisk on this region, noting that your citizens were calling for an end to assaults on water and land more than a decade before *Silent Spring*, more than two decades before the Florida water and land revolution of 1972.

Florida environmental historian Jack E. Davis credits Sarasota writer John D. MacDonald with the first ecological novel. That novel was not *Condominium*, in 1977. It was *A Flash of Green*, in 1962. The plot was inspired by activism in local groups that MacDonald had helped found in the decade before, such as the Committee for a Better Sarasota and the Non-Partisan Citizens Committee, which launched the Sarasota Civic League and Citizens Bureau of Government Research.

In turn, *A Flash of Green* inspired locals to organize Save Our Bays, more proudly known as the SOB's. Such groups did much more than halt dredge-and-fill projects instigated by what MacDonald variously called "zoning busters," "anti-planners," "money grubbers," "hit-and-run contractors," or "fast-dollar buckaroos." The groups also brainstormed a few other important community ideas. One of them was called New College.

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Throughout the next half century, communities in this watershed took the idea of an Ethical Water Age more seriously than most others in Florida. In the 70s and 80s, Manatee County, which discharged wastewater from thousands of septic tanks and small, inefficient package plants directly into Sarasota Bay, invested in what was then one of the largest capital projects in the state to achieve today's discharge rate, which is zero.

In the first decade of the new century, Manatee and Sarasota counties became some of the most water-conscious in the state. Residents of the two counties lowered their average daily water use to about 60 gallons a person – while the average Floridian still uses a hundred gallons more than that, every single day.

In 2007, Sarasota County passed the first strict fertilizer ordinance in Florida, overcoming the bulging financial and political muscles of the fertilizer and turf grass industries to protect local waters. The county's ordinance later inspired dozens more local governments to enact similar laws.

Atop your rich local history of water activism, part of the reason this community could come together on such hefty issues is that you are galvanized by the masterpieces of your watershed. The Bay and the Gulf instill pride of place like the massive Rubens that take up entire walls at the Ringling Museum.



*Peter Paul Rubens gallery at the Ringling Museum of Art, Sarasota.*

But to really live ethically with water, we must consider the watershed in its entire collection: Not only the masterpieces, but the rainfall and the rivers, the smaller bays and the sloughs, the tributaries and the tidal streams. Even the canals and the ditches, the storm ponds and the storm drains, are part of the collection.

When my husband and I took our son and daughter to the Ringling recently, we were dismayed to find our kids bored by the masterpieces; the Rubens and the entire baroque period, despite all the blood, arrow punctures and nude body parts. But after coaxing them through the museum's different wings, we finally got to one that filled them with joy. It was the Swiss artist Zimoun's sound sculptures that use hundreds of tiny motors to tap wire, cotton, and other items against hundreds of cardboard boxes, creating mesmerizing sounds.

I found myself as moved by Zimoun's work as my children were. Because in every room, to my ears, the sculptures spoke to me as rain – rain on a roof; a hard rain; a soft rain; a thundering rain.



*“Sound sculpture” installation by Swiss artist Zimoun.*

Hundreds of tiny wires banging against hundreds of cardboard boxes became as important as the masterpieces.

In the Ethical Water Age, hundreds of tiny raindrops trickling into hundreds of homeowners’ rain gardens become as important as Sarasota Bay.

Development now covers more than 75 percent of this watershed, most dominated by medium- and high-density residential and commercial buildings. Most were built before stormwater regulations in 1982. So the massive drainage systems of the Modern Water Age conspire with miles of paved surfaces to whoosh dirty stormwater into the tributaries, into the smaller bays, and into Sarasota Bay.

In the same way that every person in Sarasota and Manatee counties has come to use 100 gallons less water than the average Floridian, what if every person were to convert a paved surface to a pervious one? What if every family created a rain garden, in the spirit of Kansas City, Missouri’s 10,000 Rain Gardens initiative?

At the design level, what if every developer planted grassy swales instead of building curbs and stormwater ponds to coax rainfall back down to the aquifer? Thanks to a Sarasota County study you’ll hear about this week, we know that nitrogen and phosphorus loading are 93% and 82%

lower, respectively, in neighborhoods designed with such swales, rather than curb-and-gutter systems.

At the local government level, what if every city and county adopted an “all-green” stormwater plan like Philadelphia’s? To halt sewage spills and comply with the Clean Water Act, the City of Brotherly Love was looking at a \$10 billion price tag for a massive sewage tunnel under the Delaware River. Instead, Philly is spending \$1.6 billion to restore streams; remake everything from parking lots to basketball courts with porous pavement; and plant miles of vegetation atop rooftops and along city blocks.

Given this watershed’s history, I have no doubt you’ll do all of this and much more, continuing to lead the rest of the state to the Ethical Water Age, in the same way you helped the rest of us see that we could stop the fast-dollar buckaroos, and use a lot less water and fertilizer.

But the future challenges are bigger than the past’s. What the previous threats had in common was that they were local or internal: Your own sewage pollution; your own groundwater over-pumping; nutrient-rich fertilizers flowing off your own green lawns into the Bay.

Going forward, the challenges are no longer of your own making. They are as interconnected with the rest of the globe as pop-art Lego Man – without the harmless fun.

They include invasive species creeping along the southwest Florida coastline like green mussels, which have smothered native oyster reefs and created serious economic problems for industry in nearby Tampa Bay. They include consequences of oil drilling in the Gulf of Mexico such as the BP Deepwater Horizon disaster.

But the most obvious challenge is the one we in Florida talk about the least. The changing climate. There may be little we can do to steel ourselves for the likes of foreign invaders or drilling disasters. But there is plenty we can do to prepare for the water impacts of climate change, from declining rainfall to increased frequency of extreme storms. It involves rediscovering our secret watersheds, and learning to live with them again.

Another unintended consequence of the compartmentalized Modern Water Age of the 20<sup>th</sup> Century was that it left us more vulnerable to those climate-change threats in the 21<sup>st</sup>. As we reconnect our watersheds physically and psychologically, we will make our communities increasingly resilient.

This is the lesson emerging from the nations that have already begun to experience the water impacts of climate change. Australia is one place that began to feel those effects earlier than the rest of us. Fifteen years ago, Australia entered a drying period that seemed much more severe than normal drought cycles. The first sign that something was different was the dams across the continent dropped below 35% capacity, unheard of in previous droughts.

Much of what you read about Australia’s response involves desalination plants on the coast and agricultural water markets in the Murray-Darling basin. But another key story is that under the

specter of climate change, water managers there have come to see that they cannot rely solely on energy-intensive technology and infrastructure. There's a great urgency to re-establish watersheds and keep water in ecosystems – not only restoring wetlands, but managing forests for water supply and returning water to nature as an adaptation strategy.

The Netherlands has perhaps the proudest water-engineering history in the world, including some of the largest modern dikes and its multi-billion-dollar Delta Works to keep the low-lying nation safe from the North Sea. But Dutch engineers were surprised when it turned out sea-level rise was not the first climate-change threat they encountered. The first trial was river flooding.

The Dutch are experiencing wetter winters and more extreme summer showers. These changes, along with deforestation and urbanization, mean much more river runoff than ever before. Ironically for the safety-minded Dutch, the intense barricading of the Delta Works means there's no place for all that extra water to go – but up and over dikes.



*View of Delft*, Johannes Vermeer, ca. 1660

In the 1990s, the country was surprised by three mighty floods of the Rhine and Meuse rivers. One of them forced 250,000 evacuations and caused \$1 billion in damage – after the country had spent \$6 billion and four decades on the Delta Works to relegate flooding to the history books.

Today, the new dangers posed by river flooding, along with pollution and other problems wrought by the Modern Water Age, have led to an extraordinary turnaround in a country whose history is defined by building stronger and stronger dikes. The Dutch are working to re-establish their historic watersheds – tearing down some dikes, flooding agricultural land with compensation to farmers, and restoring wetlands on the grand scale. And just in case, they are also building floating houses.

I began this talk with the work of an artist in the Netherlands; Lego Man appears to be the creation of a Dutchman named Leon Keer. This watery country is also where I end. The Dutch have come to see water as a work of art. It is not a work defined by the straight lines of modernism. It is not the separate-piece work of a mosaic. It is a landscape of the entire watershed that blends many different brushstrokes and colors. Less Lego Man and more *View of Delft*, a waterscape that is beloved not so much for the broad river it depicts as for the way Vermeer was able to capture the glitter of a recent rainfall on the village.

In the Modern Water Age of the 20<sup>th</sup> Century, we erased our historic memory for watersheds, wetland by wetland and raindrop by raindrop.

In the Ethical Water Age of the 21<sup>st</sup> Century, we are going to get them back. This is *your* art – revealing the beautiful secrets of your watershed. Thank you.