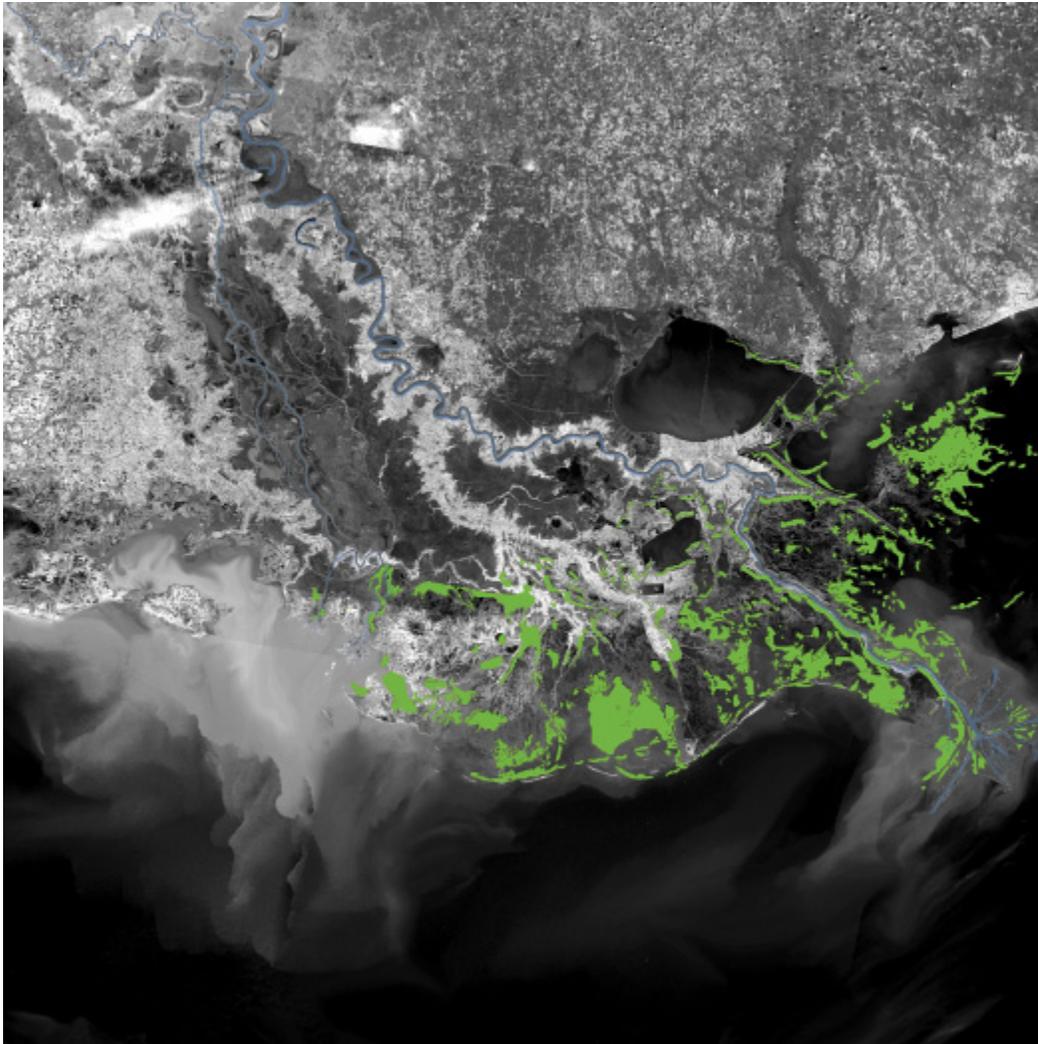


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## In the Mississippi Delta: Building with Water



20th century wetland loss, mapping by LSU professors Michael Blum and Harry Roberts. [by the Coastal Sustainability Studio]

In the post-Katrina landscape of Louisiana and the Gulf South, nothing is more pressing than the challenge of how to sustain settlement in the coastal regions. The 2009 mapping, by Louisiana State University professors Michael Blum and Harry Roberts, of predicted sea level rise by 2100, forces a dramatic rethinking of options for the future. [1] Without massive land-building efforts, the coastal region will disappear within a relatively short time. This clearly has implications on a regional scale for the future of the landscape and of the towns and cities of Southern Louisiana. The mission of Louisiana State University's Coastal Sustainability Studio, initiated in 2009, is to address this challenge in the context of finding sustainable solutions for human settlement in the region.

For several centuries now, in fact, the forces of settlement have been altering the natural flux of the Mississippi River, creating a complex landscape that is the result of the geophysical forces of the Delta,

[massive civil and environmental engineering](#), and the culture of the people of South Louisiana.

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For thousands of years the Mississippi coursed freely across the Delta plain as it searched for faster routes to the Gulf of Mexico. Over the last 300 years, the remaking of the coastal landscape for the purposes of resource extraction, national expansion, commercial shipping, urban development, and flood protection has severely curtailed the deltaic processes of the river. Today it is unmistakably clear that the results of human intervention — dramatically escalating land loss and rapid wetland destruction are only the most visible signs — are imperiling the future of Louisiana. The amplification of the impacts of these interventions has brought us to this moment in the early 21st century when, following a series of disastrous storms, the engineered landscape of coastal Louisiana has reached its breaking point.



The Lower Ninth Ward. [via [UW NOLA](#), photograph by Andrew Leaf]

New Orleans has been described as a city with a “near-perfect situation and an almost unimaginably bad site.” [2] The city’s location near the mouth of the Mississippi gives it strategic command over the continent’s most significant inland waterway and makes it a key player in the mediation of international trade. At the same time the geophysical realities of its location, especially the low elevation and land subsidence, are less than ideal, making the city increasingly vulnerable to flooding and storms. But again, it is human activity — the constraining of the delta with levees, the petrochemical industry’s fragmentation of coastal landscapes, and the inappropriate location of urban development — that has accelerated the loss of protective wetlands and barrier islands and created the catastrophic situation we face today. Many communities are highly vulnerable to the potential damages of future flooding and storms.

LSU’s Coastal Sustainability Studio brings together faculty, research fellows, and undergraduate and graduate students of the School of the Coast and Environment, the College of Engineering, and the College of Art and Design. Scientists, engineers and designers collaborate on projects and develop techniques for reducing environmental vulnerability and enhancing community resilience.

More specifically, the CSS’s mission is to undertake work not only speculative in its outlook for a long-term future but also community-driven and influential in real ways. This drives a project approach that

incorporates political and economic realities as well as research-based investigation into possible scenarios. What we propose in development terms is thus constrained by the likely realities of ecological impacts (for instance, the risk of future storms and sea level rise); likewise, considerations of ecological sustainability are tempered by social and economic imperatives. We have found that this approach, far from limiting our ability to think broadly or respond to community needs, has been a blast of fresh air for a place tired from years of grand promises and little return.



The deteriorating natural defense of New Orleans. [courtesy of the Coastal Sustainability Studio]

Our fundamental conceptual break has been with the primacy of the master plan. We identify key topics for speculation through consultation, research and analysis; key themes have included housing and neighborhoods, wetlands regeneration, productive landscapes, and urban recreation and economic development. We then develop a series of transparent scenarios, making clear the assumptions that underpin them so that they can inform decision-making, and we evaluate these scenarios against various performance criteria, including carbon footprint, sea level rise, storm and flood defense, investment and potential return. In our recent studio we further developed these scenarios into a larger vision for the future of neighborhoods within a restored coastal environment.

The CSS regional approach starts with a commitment to return the Mississippi River to its role as delta builder. But this is not simply a call for restoration. The tremendous growth of communities, industries and shipping along the river's banks has profoundly altered the entire landscape. Any changes to the current operation and control of the river will be a highly complex procedure that must engage coastal scientists, engineers and designers.

The primary action that we have proposed is a series of spillways constructed at strategic locations

along the gulf, with the spillway gates to be periodically opened when the Mississippi is high, providing a steady pulse of sediment that over the century will build up, maintain and protect large expanses of land. There is precedent for this approach: west of the Mississippi, near the mouth of the Atchafalaya River, the Wax Lake Outlet has for several decades been diverting sediment and building up a significant delta. And other diversions, like the Bonnet Carre Spillway, which redirects Mississippi floodwaters into Lake Pontchartrain, have been constructed to protect New Orleans (although in this case the diverted sediment is wasted at the bottom of the lake).



Proposed Lower Ninth Ward farmer's market. [courtesy of the Coastal Sustainability Studio]

Our delta-wide proposal encompasses five diversions operating at the endpoints of the five historic basins of the delta, with each diversion designed as a hybrid between soft and hard infrastructure, strategically placed with regard to ecological, economic and settlement patterns. Our goal is to make the river once again flexible and powerful, with the resulting land-river dynamics working in harmony with existing and future delta communities.

But "giving the river room" at the regional scale presents huge challenges and opportunities at the local scale. It is not enough simply to allow the river to rebuild subsiding land. Our communities must develop the tools to grow in harmony with changing conditions. The CSS approach to the city, town and neighborhood is predicated on nurturing settlement patterns that work *with* wetland and river processes and that are resilient to their sudden fluctuations. The neighborhood as we know it will have to evolve — to become better integrated with natural systems and flexible to changing water levels. Its architecture will have to become nimble, and increased open space will be needed to absorb seasonal floodwaters. Much of the Lower Ninth Ward, for example, was formerly wetlands, and will need to be re-imagined as a flexible urban/protective/middle zone once again. To do this, we propose restoring the

Central Wetlands Unit — the 30,000 acres of cypress forest that once protected the Lower Ninth from hurricanes, until the cutting of the 76-mile-long Mississippi River Gulf Outlet in the mid 20th century brought saltwater into the marsh, killing the cypress in just a few years.

Living with sea level rise, land subsidence, and increasingly destructive storms is a bleak and terrifying prospect for the citizens of Louisiana. A sustained and resilient future for New Orleans and coastal Louisiana will depend upon the power of the Mississippi River to build land and feed the wetlands that provide essential protection from storms. The Coastal Sustainability Studio seeks to bring the power of the river back to the heart of New Orleans and challenges us to see a future based not on the river's control but on its potential to shape a new landscape.

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