

**Houses in the floodplain
on South Carolina's
Johns Island**





By Mike Maciag

Photographs by David Kidd

RISKY WATERS

Everyone knows it's a bad idea to build new development on flood-prone land. So why do we keep doing it?

here are signs of development seemingly everywhere on Johns Island, at the edge of Charleston, S.C. Traffic on and off the island routinely backs up. Balloons and arrows posted on utility poles direct motorists to open houses. Signs advertise single-family homes from the low \$200s, a bargain compared to those a short drive away in central Charleston.

At 84 square miles, it's one of the 10 largest islands in the contiguous United States. But until recently, it has been sparsely populated. Now crews are clearing land to make way for sprawling subdivisions. The island's population has doubled in the past two decades to nearly 20,000, with much more growth expected as thousands of new homes go on the market.

Some of the residents of Johns Island are encouraged by the development; others are unhappy with the prospect of substantial change. But all of them are aware of what has happened nearby, in the West Ashley area of the city, just across the Stono River. West Ashley offers a cautionary tale of floodplain development. Decades ago, the Federal Emergency Management Agency (FEMA) misjudged how a certain creek basin functioned, so homes were built where officials now say they shouldn't have been. Floods devastated West Ashley subdivisions in each of the past three years, most recently during Hurricane Irma in 2017. It's a dire scenario that local officials are trying to avoid on low-lying Johns Island as development accelerates.

What is happening in South Carolina is not an isolated case. Many vulnerable areas of the country are seeing significant residential and commercial development despite the long-term flood



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Floodplains cover much of the Charleston region's landscape.

risks. *Governing* analyzed the latest U.S. Census Bureau survey data using a methodology from the New York University Furman Center to estimate the population living in FEMA-designated 100-year floodplains. Nationally, the number of Americans living in these high-risk areas in 2016 climbed 14 percent compared to those living in the same neighborhoods in 2000. That's actually faster than in areas outside of flood zones, where the population increased 13 percent. "The nation is spending billions every year to move people into flood-prone areas and keep people living in flood-prone areas," says Rob Moore of the Natural Resources Defense Council. "We've gotten exactly what we paid for."

Indeed, construction is permitted in Charleston and other floodplains across the country, provided it meets regulations mostly set by state and local governments. For its part, the federal government certainly doesn't discourage development. Rules under the National Flood Insurance Program are limited and don't account for sea-level rise. Additionally, the Trump administration has proposed rolling back some rules, which could pave the way for more development. It's happening despite a slew of recent studies warning of greater risks than previously estimated resulting from sea-level rise in areas like those off the South Carolina coast.

This is a crucial time for the future of Johns Island, as nearly 4,300 new housing units have been approved for development. The Charleston City Council has passed a temporary building moratorium for the area around the creek basin in West Ashley and is considering doing the same for Johns Island. A petition from



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island residents calls for the city to cease residential permitting for two years. “It’s leading to a healthy discussion and [there are] some tough decisions on the horizon as to whether development is allowed in a 100-year floodplain or not,” says Charleston Mayor John Tecklenburg. “Or, if it’s going to be allowed, will it have extra special requirements that other areas wouldn’t have?”

Historically, Johns Island was an unincorporated part of Charleston County, much of it farmland. Today, although some of the island has been brought into the city, most of it remains rural and ripe for development, offering large parcels unavailable elsewhere in Charleston. Much of the housing has been concentrated along the island’s higher ridges; low-lying forests act as a sort of sponge, absorbing water during floods. But increased development is threatening those forests, as trees are being cut down and more of the land is being covered with impermeable surfaces.

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But it’s not flooding that Johns Island residents complain about most these days. It’s the inability of the island’s limited infrastructure to handle the increasingly heavy traffic on and off of it. Wagner has fought for the extension of an interstate highway onto Johns Island for years, and Gov. Henry McMaster has backed funding for the project. Some worry, however, that this construction could exacerbate flooding risks, and city officials acknowledge it could lead to even more new development on the island.

Nationally, much of the development that’s taken place in floodplains is a consequence of federal regulations that do little to discourage construction in flood-prone areas. Larry Larson, director emeritus of the Association of State Floodplain Managers, sees it as a system of perverse incentives. Regardless of whether states take any steps to discourage risky developments, they still receive generous disaster relief assistance when devastation occurs. The federal government typically pays for about three-quarters of disaster assistance and over 90 percent after the most destructive storms. “They need to create some incentives



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That’s hardly the norm, however. In fact, nearly all states recorded net population gains across their FEMA-designated floodplains in recent years. Much of this was a result of more Americans moving South, with Florida and Texas collectively accounting for over half the national population growth in floodplains since 2000. *Governing’s* calculations also identified many floodplain neighborhoods where growth far outpaced that of less flood-prone areas within the same county. In Hudson County, N.J., the population living in the current flood zone rose about 55 percent over the past two decades, while the rest of the county experienced only a slight increase.

Mounting evidence further suggests that the overall breadth and severity of flooding risks have been understated. One study published in the journal *Environmental Research Letters* earlier this year estimated that three times as many Americans lived in 100-year floodplains as those identified using FEMA maps, which guide local land use regulations and flood insurance premiums. The maps are widely considered to be inadequate. Most notably, they don’t account for future sea-level rise. Some communities’ maps were last updated over a decade ago. And while the standard 100-year floodplain designation is supposed to identify areas with a 1 percent chance of flooding in any given year, many regions are experiencing far more frequent flooding. A study published in *Risk Analysis* found that in some places, more than half of the properties sustaining flood damage were actually located outside designated FEMA flood zones.

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Part of the reason is the influence of developers who lobby to get projects approved or to obtain a variance from flood ordinances. Sometimes elected officials buck the technical advice of agency staff. The Charleston County Council, for example, has approved requests to rezone several Johns Island properties to allow for higher density development against recommendations of county staff. Other times, homes or entire subdivisions are permitted even though they are in violation of building elevation requirements or other rules.

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One area that Charleston officials hope to get residents out of is Shadowmoss, a subdivision in West Ashley. Drainage problems have been apparent there since shortly after development accelerated in the 1980s and 1990s. Nearly a year after Hurricane Irma, the waterline is still visible on some of the vacant homes. “This is ground zero for what has gone wrong,” says Stephen Julka, Charleston’s floodplain manager. “It’s an example of development happening with not enough information.”

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On Johns Island, one of the most vocal opponents of additional development is Phil Dustan, a College of Charleston ecologist who has studied the island’s topography. He says some houses on the island are already sinking, septic systems are failing and

foundations are cracking as a result of all the new construction. Further developments could potentially alter longstanding drainage patterns. Retention ponds designed to limit runoff are common throughout the island and other parts of the low country. They don't, however, hold as much water as large forested areas or wetlands cleared to make way for new neighborhoods. "The natural plumbing of the land is being destroyed," says Dustan, an island resident. "So, come the flood or rains, there's going to be a man-made problem that's going to be far greater than it would be if it was just natural."

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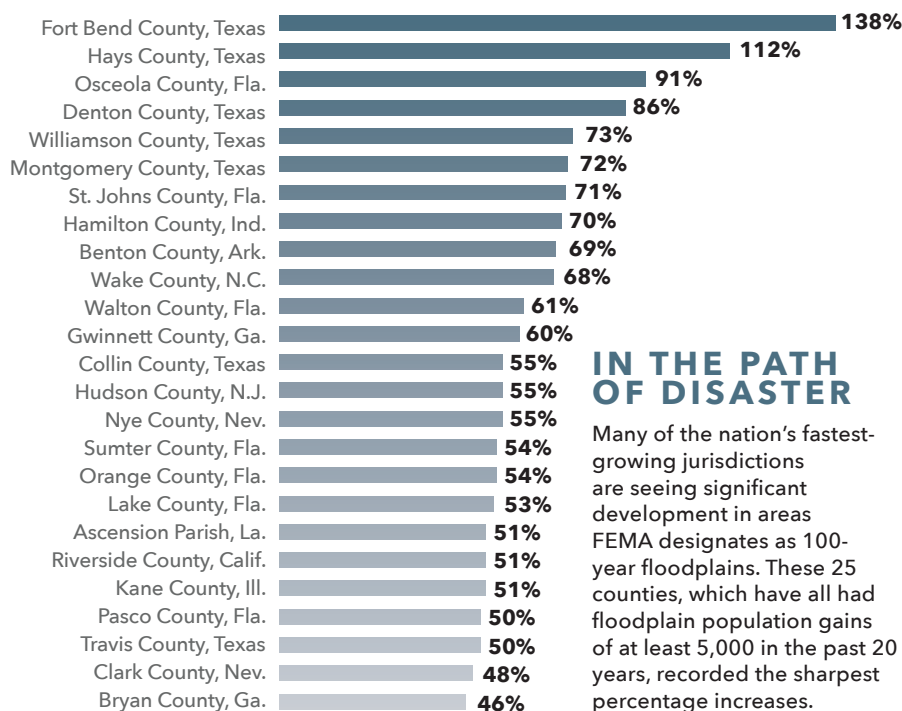
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Officials in the region are starting to embrace the idea that they'll need to collaborate more closely. "Watersheds don't know jurisdictional boundaries; however, regulatory framework does," says Kinsey Holton, Charleston's stormwater program manager. Many properties on the island annexed into the city surround unincorporated county parcels. A study reviewing South Carolina's flooding identified uncoordinated planning decisions by multiple jurisdictions as a factor hindering the overall integrity of watersheds.

Both the Charleston Home Builders Association and the island's community association agree the best solution would be a unified, interconnected drainage plan for the entire island rather than one that has developers accounting only for their individual properties. Such a comprehensive drainage system has worked well on nearby Daniel Island, which hasn't flooded. Pulling off the same approach on Johns Island could prove difficult, though, as at least six major developers would need to agree to a plan covering a larger island that's already partially developed. "It's not going to be easy," says Patrick Arnold, who heads the Home Builders

Association. "But for the long term, they would have a draining system that neither burdens the municipality nor the developers responsible for it." For its part, the city's Public Service Department says it would support a master planning effort.

As in other places, the local ordinances that are in effect right now typically can't prevent adverse effects on surrounding homes. Charleston County is considering new rules that would require projects to handle not only current waterflow from upstream, but additional future runoff expected to result as upstream areas are developed. Still, they don't want to overburden developers. "The reality of regulatory programs is that if you protect 100 percent of probabilities, you're overregulating," says Carl Simmons, Charleston County's building inspections director.



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The next few years of development on Johns Island and the decisions made to regulate it will carry ramifications for decades to come. But the underlying geographical reality is not going to change. Most of Charleston lies in a floodplain. Mayor Tecklenburg says there's a realization that the city is not going to build or pump its way out of the situation. "You've got to correct some of the sins of the past, prepare for the future and have this culture that we're ready to deal with water when we encounter it," he says.

Julka, the floodplain manager, puts it more bluntly. "It really is a land use issue," he says. "If you continue to allow development in a floodplain, you can have the strongest stormwater standards, but even with the strictest standards, you're still putting people in a floodplain." **G**

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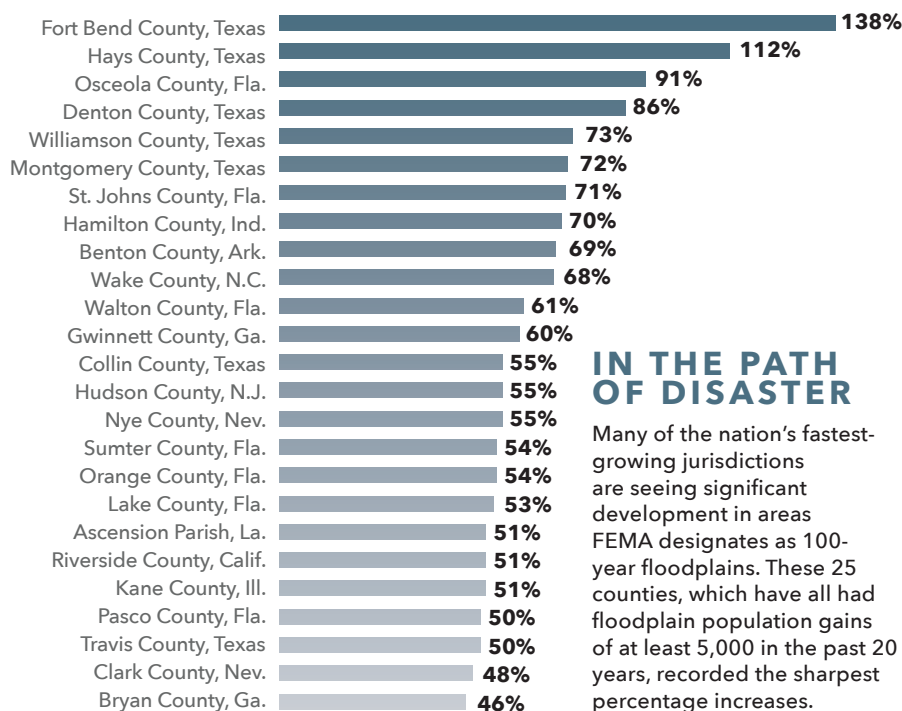
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