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ONE DOLLAR

# Probability for storm surge highest in McIntosh County

*Highest along Atlantic seaboard, project seeks solutions*

Remember when Hurricane Irma caused tidal flooding here in McIntosh County on Sept. 11, 2017? That was the worst storm surge to impact McIntosh County since Hurricane Dora in 1964.

Sapelo Island suffered much

damage to homes and the University of Georgia Marine Institute (UGAMI), as well as homes in low lying areas on the mainland of the county.

Sapelo Island and the rest of

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# Surge

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the county are quite vulnerable to storm surges and this is why.

Francis Ho conducted a storm tide frequency analysis for the 100-mile coastline of Georgia in 1975. She studied tide heights for the 10-year, 50-year, 100-year and 500-year return periods between the Florida border and South Carolina border.

Ho writes, "The capacity of a hurricane of given characteristics to produce a coastal surge depends on the profile of water depth. The shallower the coastal water, the higher surge... The study area has the highest shoaling factor along the Atlantic coast, because here the Continental Shelf slopes seaward most gradually... The shoaling factor curve reveals that a maximum factor is reached at Sapelo Island, GA., where the highest surge would be produced by a hurricane striking the coast a few miles to the south."

University of Georgia College of Engineering students conducted a yearlong capstone project to develop flood control techniques to lessen the flooding at UGAMI, which is situated on Lighthouse Creek, making it more vulnerable. Their work has earned the group a first place recognition for its impact on coastal communities.

Hayley Clement, with the College of Engineer-

ing at UGA, wrote about the project.

"While the institute has some flood mitigation measures in place, much of the existing bulkhead is in need of replacement and upgrade. This also provides an opportunity to consider nature-based solutions.

"Engineering students Clare Deberry, Skylar Gray, Benjamin Smith and Sarah Younce were tasked with assessing the site, developing storm surge models and designing potential solutions to mitigate flooding that could endanger UGAMI's staff and campus.

"The group traveled to Sapelo in October 2023 to conduct their initial site visit, take photos and measurements, and discuss concerns with UGAMI staff and OEP/ICM experts.

"Going on a site visit that lasted several days is a benefit our group had that few others did," Gray said. "Being able to connect with not just each other, but our clients in the mundanity of making dinner or forgetting bug spray was paramount to being comfortable and driven to do our best on this project."

"Over the next several months, the students conducted in-depth research to develop sustainable flood control solutions for the Institute. They considered several factors, such as costs, and the proposed solution's long-

term viability and its environmental impact.

"This project was unique in terms of its challenges and incorporation of history and culture," Younce said. "The consideration of coastal habitats and community integration is what inspired my interest in engineering my freshman year, and it was a great opportunity to apply those interests in a real-world application."

"In spring 2024, the team delivered their findings and proposed three solutions. Their recommendations included cultivating a "living shoreline" with flora and fauna along key areas of the creek, replacing and updating the existing bulkhead system -- a specially designed wall that separates water from land -- and installing a series of berms, which are barriers made of dense sediment that slow flooding and absorb excess water.

"The group presented their project to the College of Engineering's annual Capstone Design Showcase in April alongside 116 other student teams. The months of extensive research, conversations and modeling paid off, and they took home top honors in the Community Impact for a Public Client category.

"The students were receptive to our input, and it was great to see the final product," said UGAMI Director Merryl Alber. "They provided well-researched solutions and considered multiple angles that can help coastal communities facing flooding."

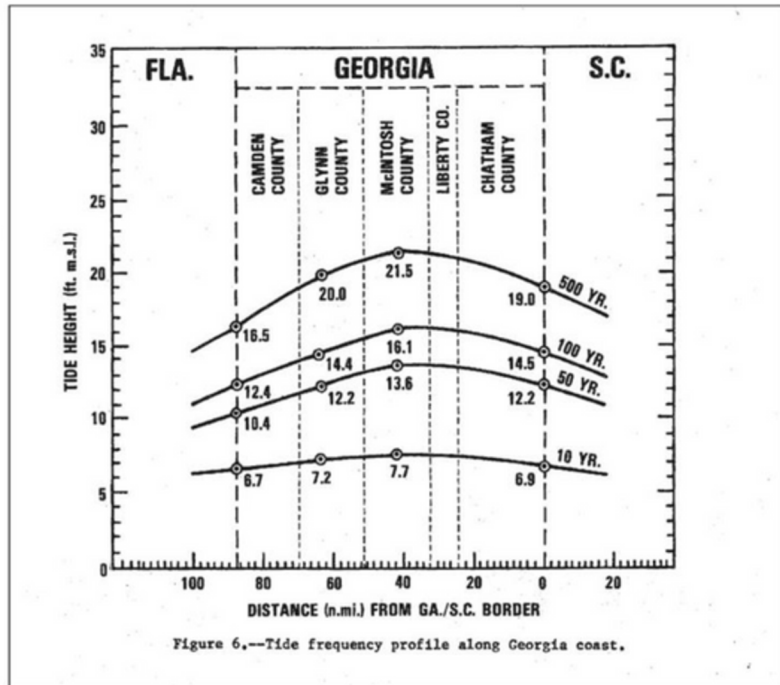


Figure 6.--Tide frequency profile along Georgia coast.

Tide Frequency Profile along Georgia Coast (NOAA Technical Memorandum NWS HYDRO-19, Storm Tide Frequency Analysis for the Coast of Georgia, Francis P. Ho, Office of Hydrology, Silver Spring, Md., September 1974)

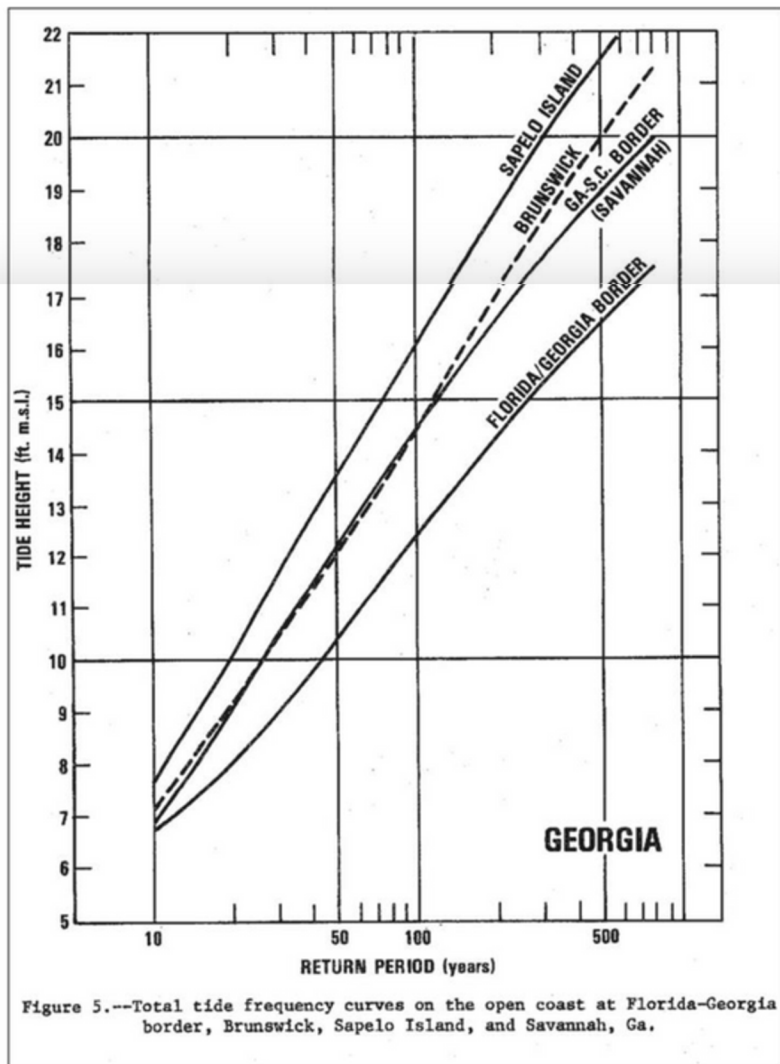


Figure 5.--Total tide frequency curves on the open coast at Florida-Georgia border, Brunswick, Sapelo Island, and Savannah, Ga.

Total tide frequency curves on the open coast from Florida-Georgia border, Brunswick, Sapelo Island and Savannah. (NOAA Technical Memorandum NWS HYDRO-19, Storm Tide Frequency Analysis for the Coast of Georgia, Francis P. Ho, Office of Hydrology, Silver Spring, Md., September 1974)



*After the buildings at the University of Georgia Marine Institute were flooded during Hurricane Irma in 2017, tarps on the ground were filled with scientific equipment, appliances, office equipment and furniture, while the first floor of the dairy barn was cleaned out.*



*Hog Hammock resident Tracy Walker, right, and a FEMA representative review the flood damage to his home and property after Hurricane Irma blew in 2017.*

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jarriel.lawn@

