Storm Tides During Hurricane Michael (2018)

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Hurricane Michael (2018)



Hurricane Michael Was Unique to Florida's Panhandle...



Storms To Make Landfall In Florida's Panhandle Before Michael¹ (2018)



Storms To Make Landfall In Gulf of Mexico since 2017²

> 1 – NWS (2018) 2 – WFLA (2024)

Was Michael the worst case for Mexico Beach?

Other Parameters:

- Radius of Max Winds
- **Central Pressure Drop** •
- Sea Level Rise

- **Central Wind Speeds** •



Hurricane Michael at Landfall

Storm Tides with ADCIRC+SWAN = Storm Surge + Normal High Tides





Base Simulations during Michael





Storm Tides at Panama City Beach: Base Simulations during Michael



Storm Tides at Mexico Beach: Base Simulations during Michael



Storm Tides at Apalachicola: Base Simulations during Michael



Storm Tides Increase When Central Pressure Decreases!



| Air Circulation nea | r the Eye | of a Hu | ırricane |
|---------------------|-----------|---------|----------|
|---------------------|-----------|---------|----------|

| Mexico Beach | Peak Storm Tides (m) |
|-----------------------|-------------------------|
| Base Modeled Peak | 4.74 |
| CPD76 Modeled Peak | 5.47 |
| % Increase | 15 |

This Ongoing Research Question..

How is storm tides sensitive to storm parameters?

Other Perturbations:

- SLR (0.4m, 0.8m and 1.3m)¹
- Radius of Maximum Winds $(-10\%, +10\% \text{ and } +25\%)^2$
- Central Wind Speeds (-7.5%, +15% and +22.5%) 3,4
- Storm Track Deviations (West and East)⁵
 - +/- 100km, 178 km, and 255 km

1 – Sweet et al (2022) 2 – Xu & Huang (2014) 3 – Camelo et al (2020) 4 – Emanuel (1987) 5 – Salehi (2018)

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