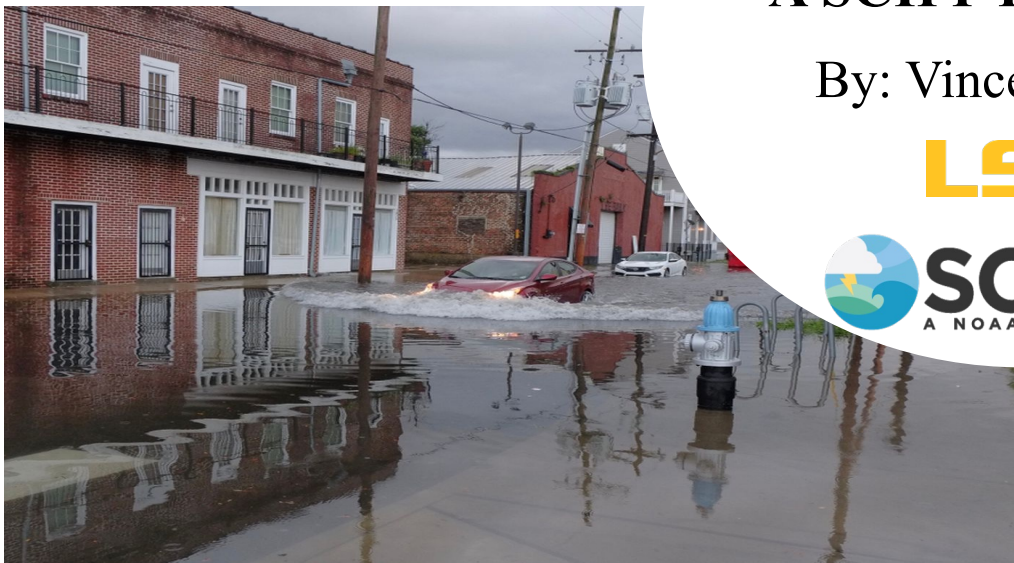




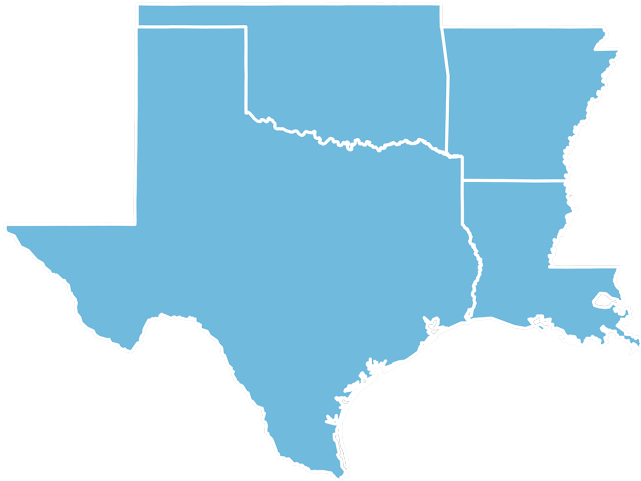
Adapting to Climate Change: A SCIPP Perspective

By: Vincent Brown

LSU



The Southern Climate Impacts Planning Program (SCIPP)



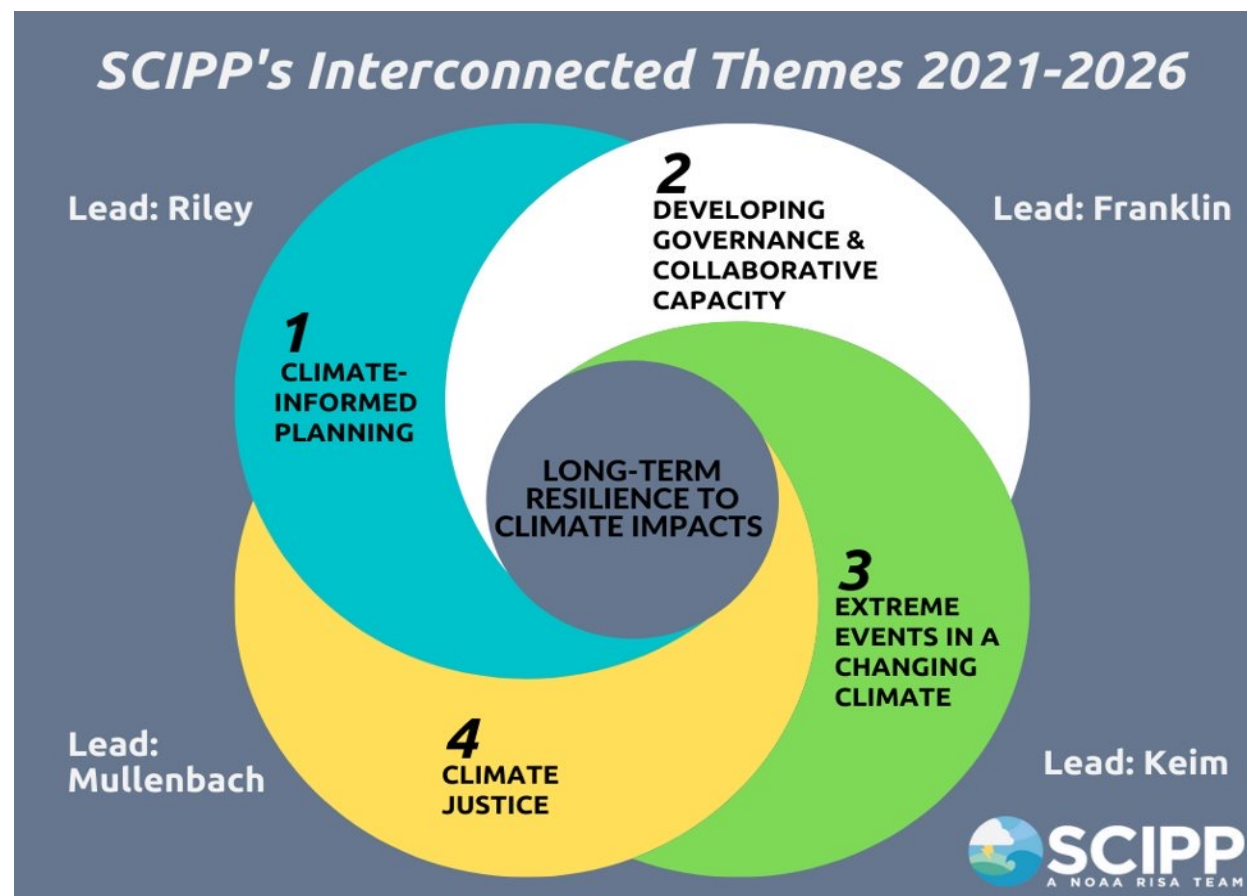
Our Mission: *Assist organizations with making decisions that build **resilience** by collaboratively producing research, tools, and knowledge that reduce weather and climate risks and impacts across the South-Central United States*

- NOAA funded CAP Team
- Twelve Active Teams Nationwide
- Partnership between OU and LSU
- Stakeholder-Driven Research



The SCIPP region is home to many tribal nations. We fully recognize, support, and advocate for the sovereign rights of those tribal nations.

The Southern Climate Impacts Planning Program (SCIPP)



Our Research

Guided by stakeholder-driven challenges regarding weather/climate phenomena.

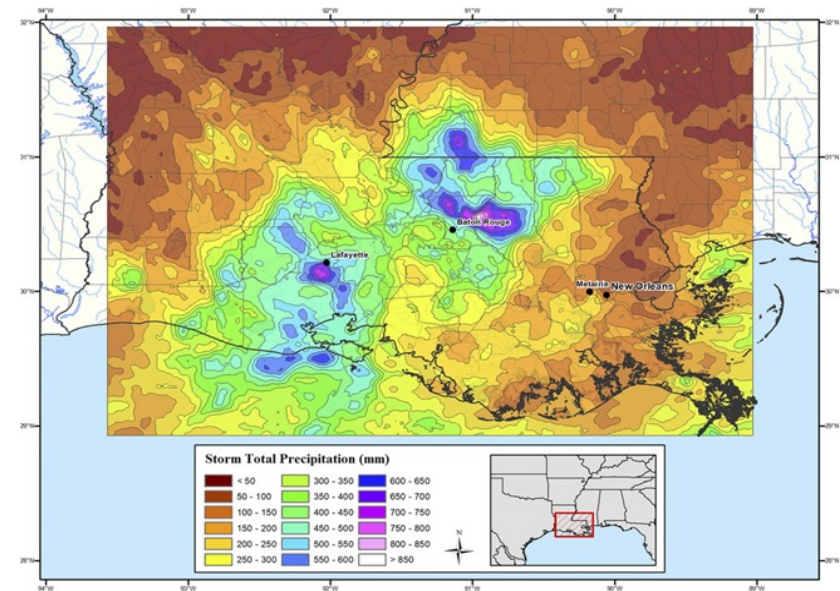
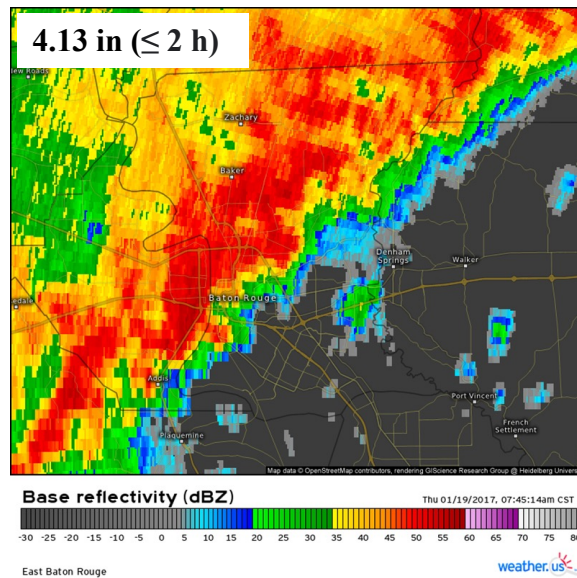
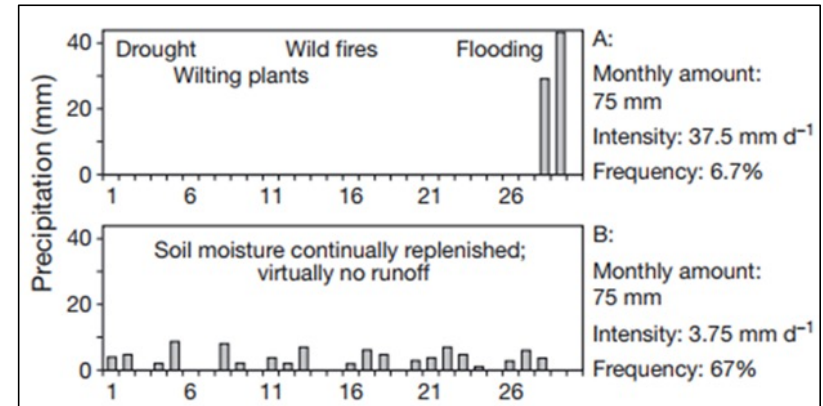


26 Aug 2020 23:01Z NOAA/NESDIS/STAR GOES-East ABI GEOCOLOR

Challenge #1 Changing Precipitation

Climate change is projected to alter the precipitation distribution.

- Our stakeholders (Water Utilities, Ag-Industry, etc.) are struggling with...
 - Short-duration events
 - Extremes
 - Variability



Climatology and Trends in Hourly Precipitation for the Southeast United States

Background

- Investigated trends in hourly precipitation times series (1960-2017) at first-order sites across the SeUS.

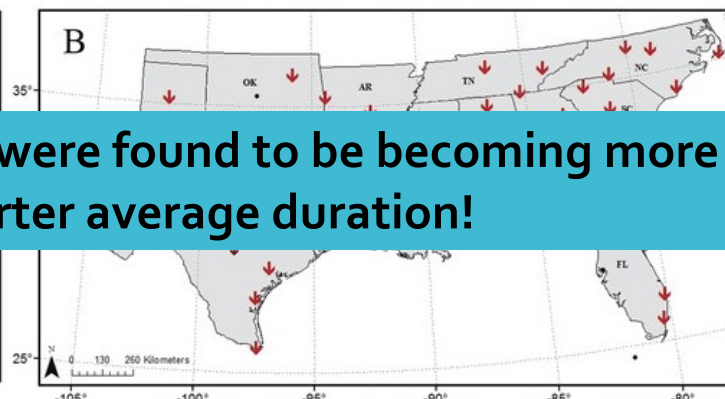
A. Annual Intensity

22 stations

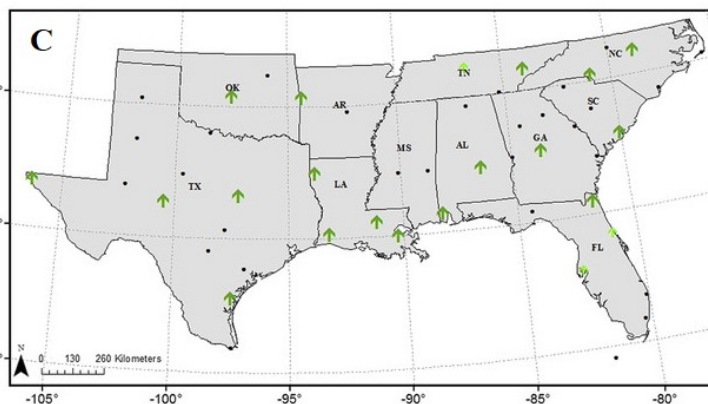


B. Annual Duration

41 stations



In New Orleans, rainfall events were found to be becoming more intense and of a shorter average duration!



C. Annual 90th Magnitude

18 stations

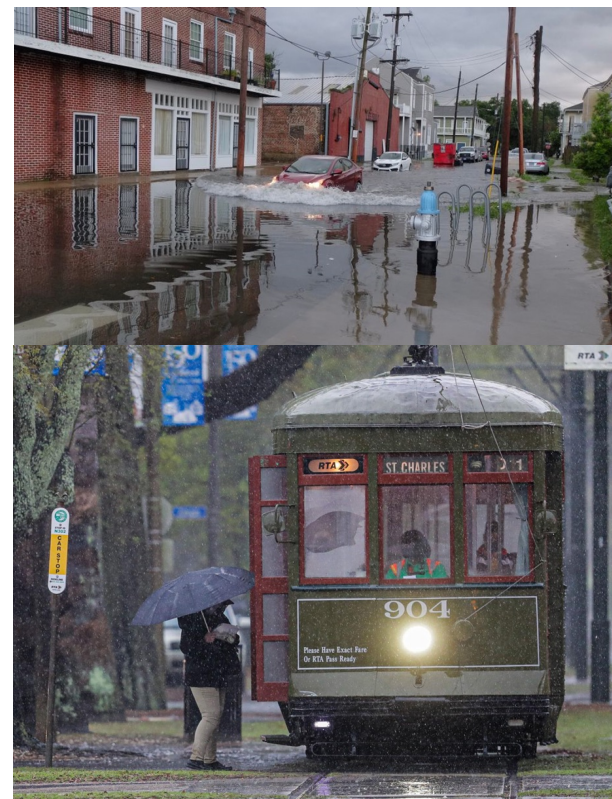
Sewerage and Water Board of New Orleans

Background

- New Orleans is likely one of the most vulnerable cities to climate change.
 - Subsidence, SLR, **Extreme Rainfall**, Tropical Cyclones, Land Loss, Heat, Poverty (24%)

Sewerage and Water Board of New Orleans (SWBNO)

- Responsible for storm water, wastewater, and drinking water.
 - **Storm water pumps designed 1.0 in per h, 0.5 in subsequent hours.**
 - 2021 = 8, 2020 = 9
- SWBNO undertaking a “once-in-a-generation effort” to improve operation and management of New Orleans drainage, water, and wastewater.



Our Research With the SWBNO

The SWBNO came to us with Question!

Research Objectives/Goals:

- Are discernable regions of the city that are more susceptible to heavy rainfall?
- Provide high resolution spatiotemporal rainfall estimates for specific events to help improve hydrologic modeling.
- Determine how climate and behavioral data can inform the development of better long-term planning and operational protocols for the SWBNO (survey).

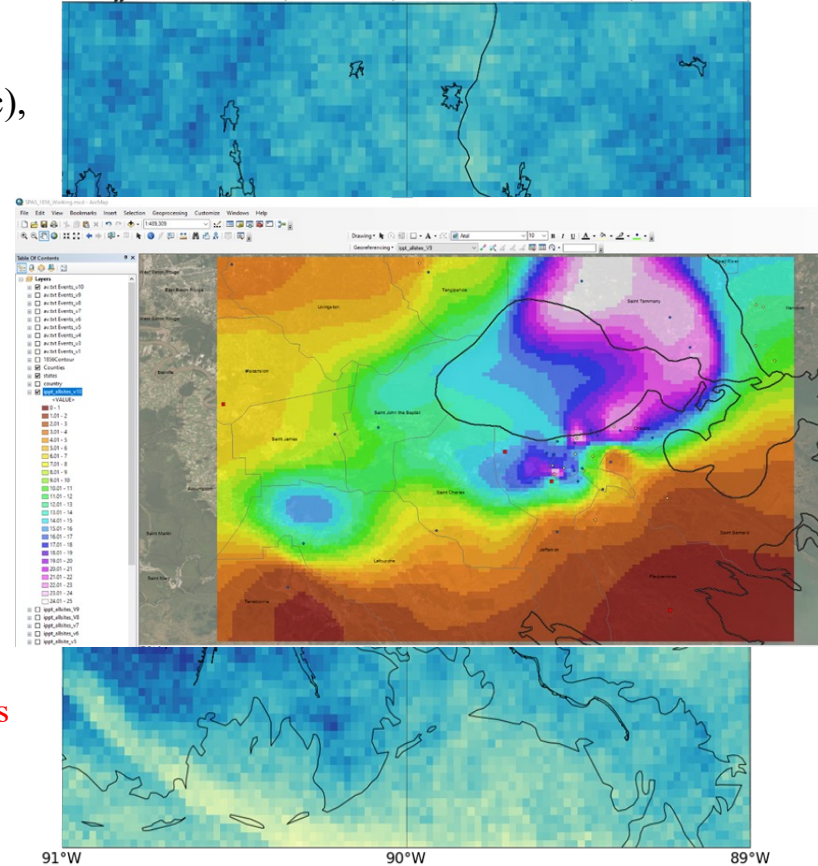


Sewerage and Water Board of New Orleans

Preliminary Results

- Using GridRad (~2km, national composite reflectivity mosaic), 2003-2017, JJA only, frequency of 40+ dBZ storms.
 - Prioritization of projects based on frequency + capacity.
- Started running storms of interest (May 1995).
 - Unique data from SWBNO.
 - Improved hydrologic modeling.
- 45 questions Qualtrics survey (414 responses).
 - SWBNO adding questions that want answered.
 - Comprehensive understanding of Orleans Parish residents needs and perceptions of climate change.

Mean JJA Thunderstorm (≥ 40 dBZ) Hours from 15 - 23 UTC (2003 - 2017)



Challenge #2 Tropical Cyclone Impacts

Annual TC frequency is expected to decrease but those that do form could* be more intense (RI), produce more precipitation, or stall more frequently.

- Our stakeholders (Planners, Water Utilities, etc.) are struggling with...
 - Frequent Tropical Cyclones
 - Earlier Events (e.g., Hurricane Barry)
 - Stalling Tropical Cyclones

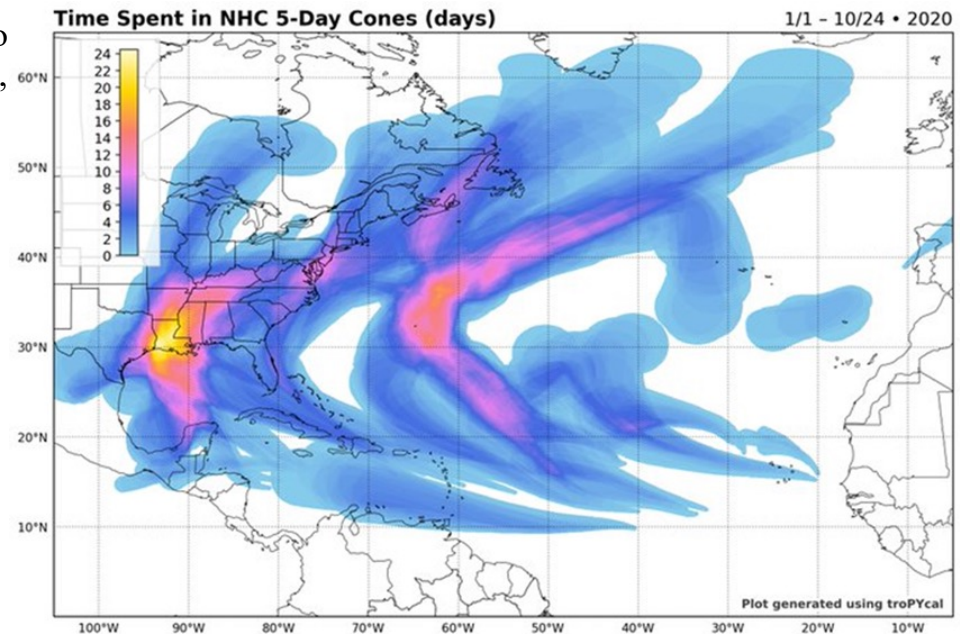
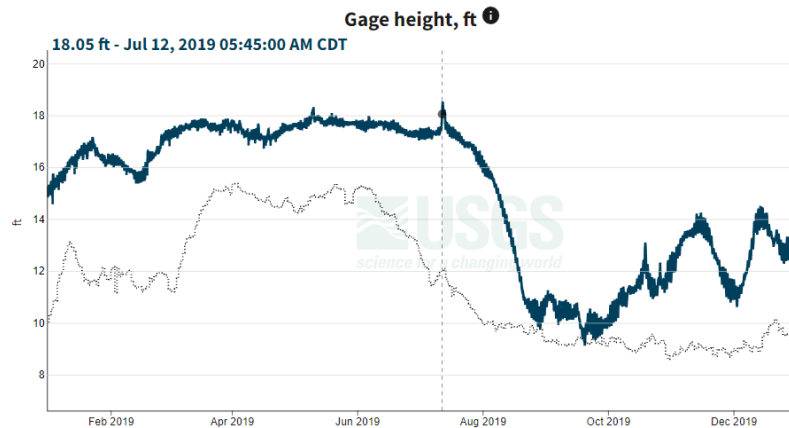


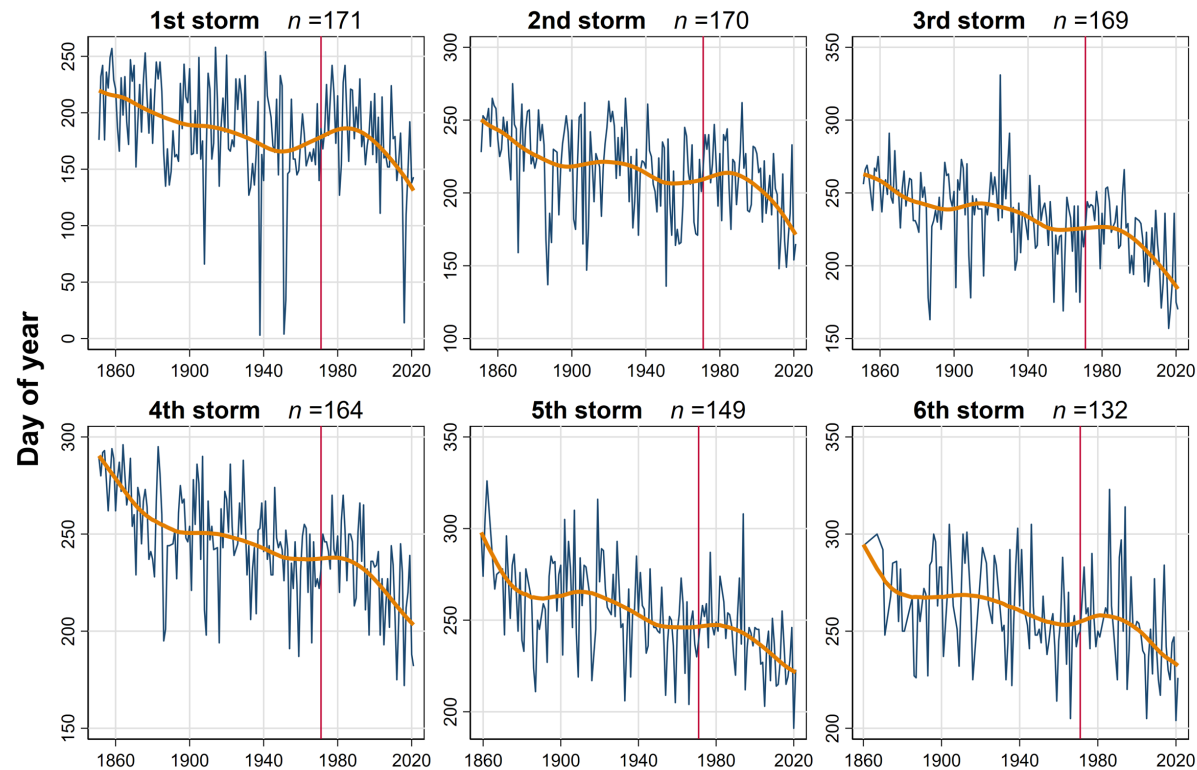
Image Credit: Sam Lillo, Ph.D. Candidate Meteorology,
University of Oklahoma, @splillo

Tropical Cyclone Occurrence Dates – Earlier Seasons!

Using HURDAT2 (1851-2021) we analyzed formation dates of named TCs.

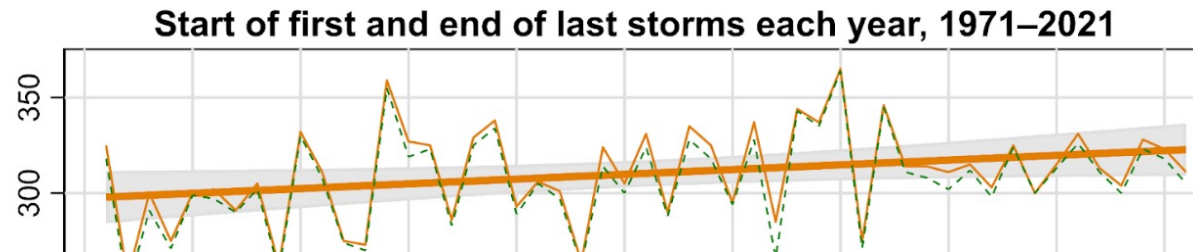
We excluded anything less than tropical storms strength and short-lived storms (< 48 h).

Starting dates of the n th hurricane or tropical storm, 1851–2021



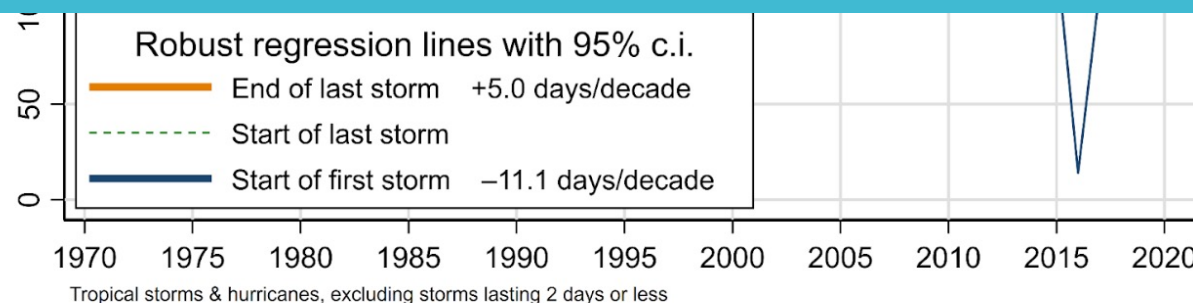
Tropical storms & hurricanes, excluding storms lasting 2 days or less

Tropical Cyclone Occurrence Dates – Earlier Seasons!



Before 2022 – the previous 7 seasons had the first tropical/subtropical storm form before the official start of HC.

Potentially expand the definition of hurricane season due to favorable conditions earlier in the season.



Incorporating Climate-Informed Planning into Species Best Practices

Research Goals: Quantify favorable locations for oyster aquaculture along the Texas and Louisiana coast, then determine if those suitable locations are projected to change given climate change.

Stakeholder Partners: Louisiana and Texas Sea Grant, Louisiana and Texas Departments of Wildlife

Anticipated Outputs and Outcomes: Peer-reviewed article, increased knowledge, capacity building, stronger professional networks.



Emerging Climate Threats to the Mississippi River Delta: Moving from Restoration to Adaptation

Raise questions about feasibility of restoration strategy and long-term sustainability of the MRD.

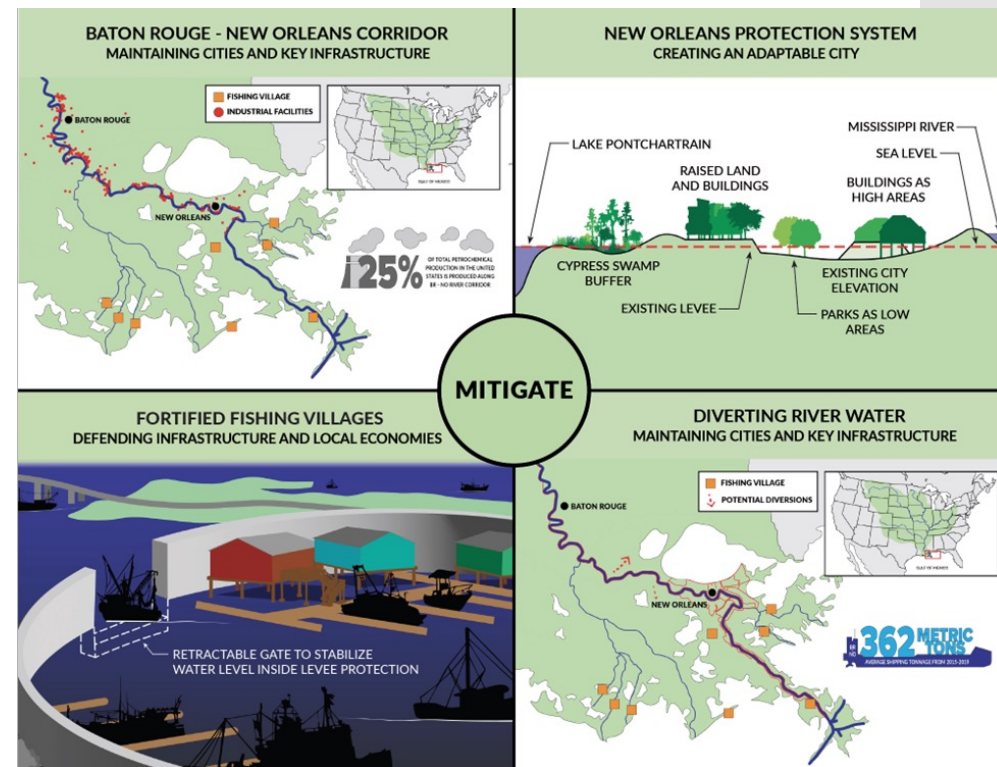
Adaptation strategies are a must!

Defensive Baselines

Diversion of MRD

Protection of BTR-NOLA river corridor

Protecting Coastal Fisheries





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A NOAA RISA TEAM