# Sea Level and Coastal Flood Risk Predictions

US CLIVAR Summit March 2022

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# Context

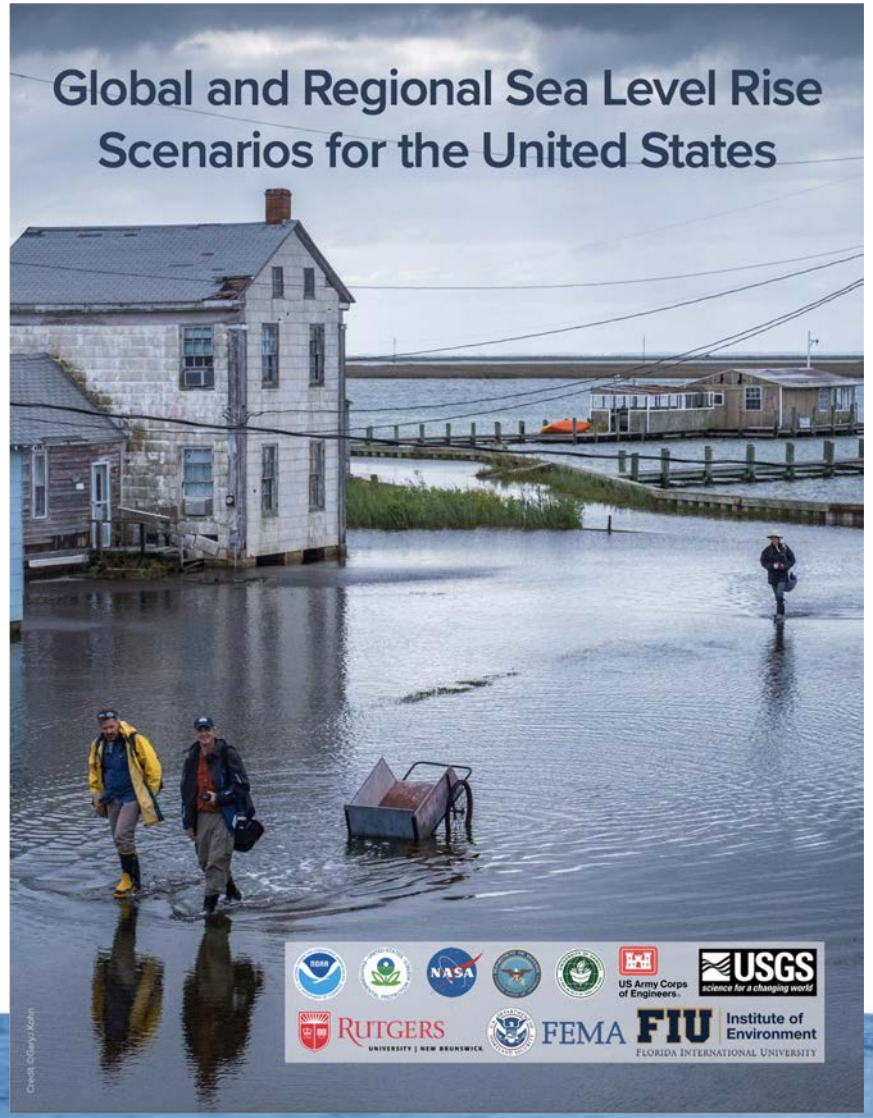
- 2021 US CLIVAR Research Challenge on climate at the coasts
- 2022 Inter-agency Task Force report
- International activities : e.g. CLIVAR+WCRP Grand Challenge on Sea Level
- 2019 US CLIVAR workshop: *Sea Level Hotspots from Florida to Maine*

# US CLIVAR Science plan addendum and white paper:
## Research Challenge on climate at the coasts

- Coasts are driven by or **respond to variations and changes** in the broader-scale **coupled atmosphere-ocean-cryosphere** system on **seasonal to multidecadal scales**. **Unique** challenges and interactions requires a **coast-specific US CLIVAR initiative**.

- This document takes the example of **coastal inundation and flooding**, an extreme and often **compound event** resulting from ocean, atmosphere, and land processes.

# 2022 Inter-agency task force report




In this session:

**William Sweet** NOAA National Ocean Services

"2022 Interagency Sea Level Rise and Flood Risk Projections for the U.S. Coastlines"

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# 2019 US CLIVAR Workshop


- What are the efforts already in place and aimed at **mitigating the effects of sea level rise** and improving overall coastal resilience?
- Where are we with **science**, and what do we know about the drivers, the uncertainty, and the future of sea level rise?
- What are the **tools and monitoring** resources currently available?
- What are **best practices** for linking scientific information with decision-making support tools and what are the gaps that need to be addressed?

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# Workshop Recommendations and Next Steps

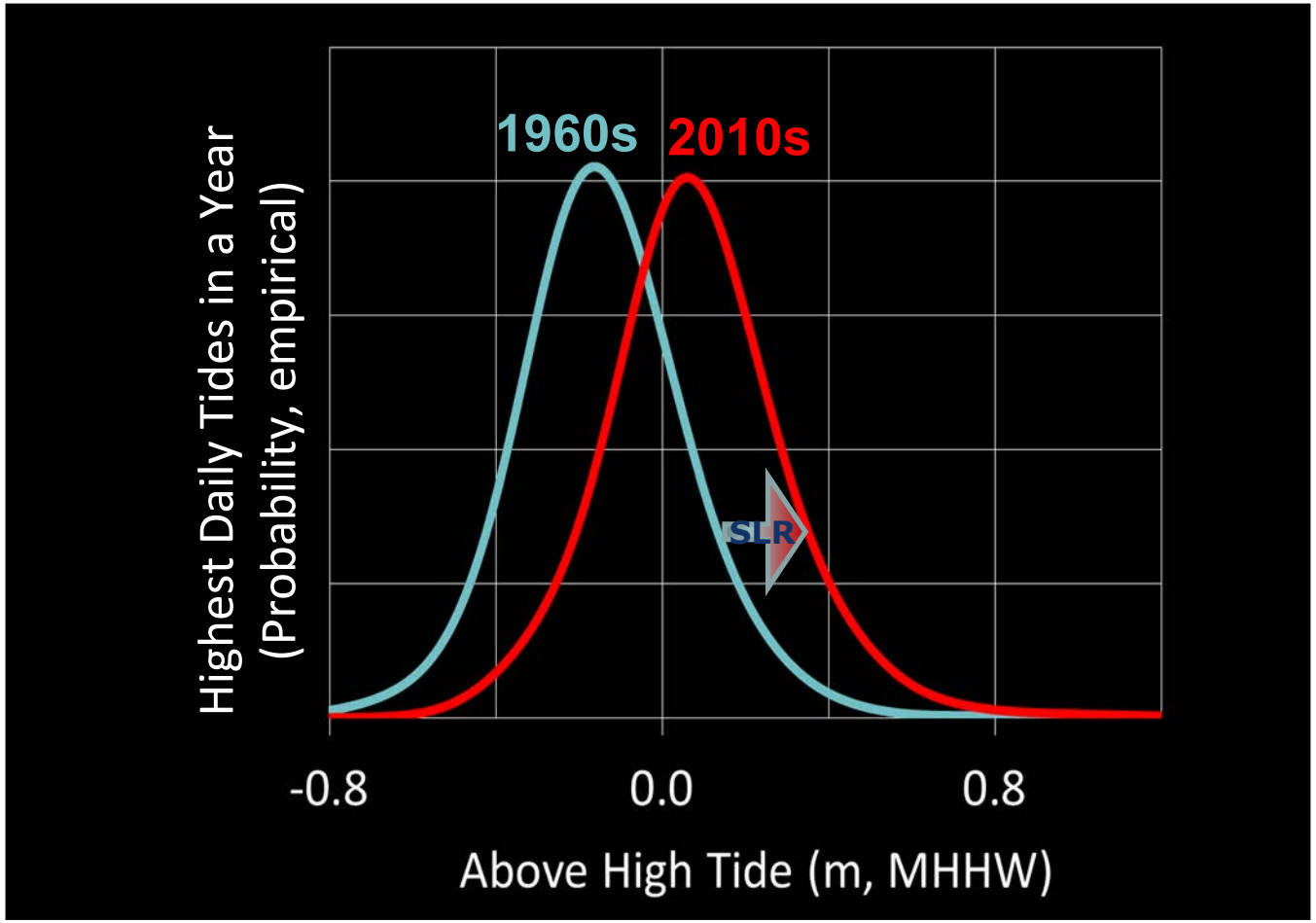
Key Research Needs:

- Improve **uncertainty quantification** of observational and modeling efforts to better support decision-making needs.
- Improve understanding of drivers of sea level variability **across timescales from subseasonal to interannual to decadal** (e.g., storminess, ocean dynamics, natural climate variation).

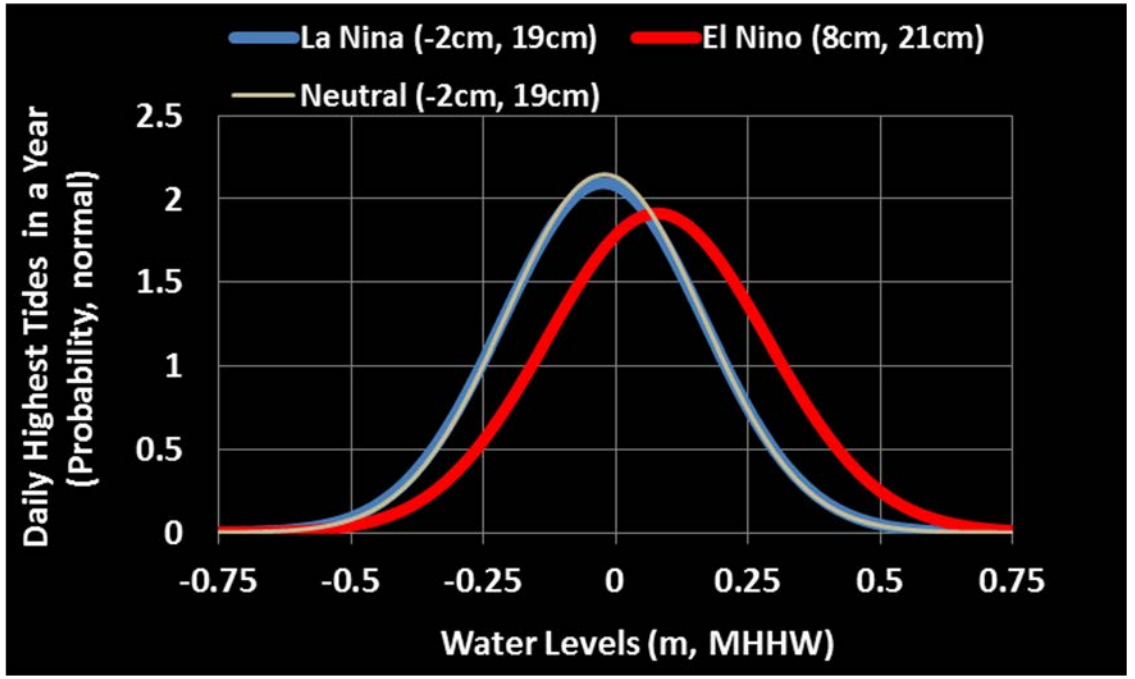
# Timescale Interactions

**Norfolk VA**

## Sea Level Rise




## Climate Variability




Courtesy of Billy Sweet, NOAA National Ocean Service

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# Discussion points and questions

1. How are low-frequency and large scale **climate modes** influencing high-frequency **sea level processes** and **flooding events predictability**?

2. What are the main **challenges and uncertainties** in our assessment and **predictability of sea level changes** and resulting flooding impacts along US coastlines?

3. In the context of **coastal inundation**, what are the main challenges and opportunities to connect climate forecasts and projections to **coastal groundwater systems** changes and their **impacts on natural ecosystems and human infrastructures**?

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# Speakers

**Denis Volkov** University of Miami, and NOAA/AOML

"The North Atlantic sea surface height tripole impacts the frequency of flooding events along the U.S. east coast"

**William Sweet** NOAA National Ocean Services

"2022 Interagency Sea Level Rise and Flood Risk Projections for the U.S. Coastlines"

**Holly Michael** University of Delaware

"Storm surge and sea-level rise effects on groundwater: an overview"

# Panel breakout session

Please address the science questions from the perspectives of your panel.