



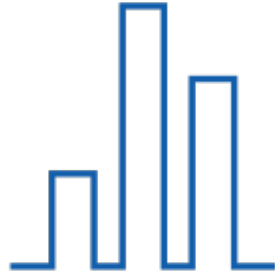
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2023

The Effects of Ocean Heat Content and Sea Level Height on Hurricanes in a Warming Climate

Keneshia Hibbert
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OCEAN HEAT CONTENT



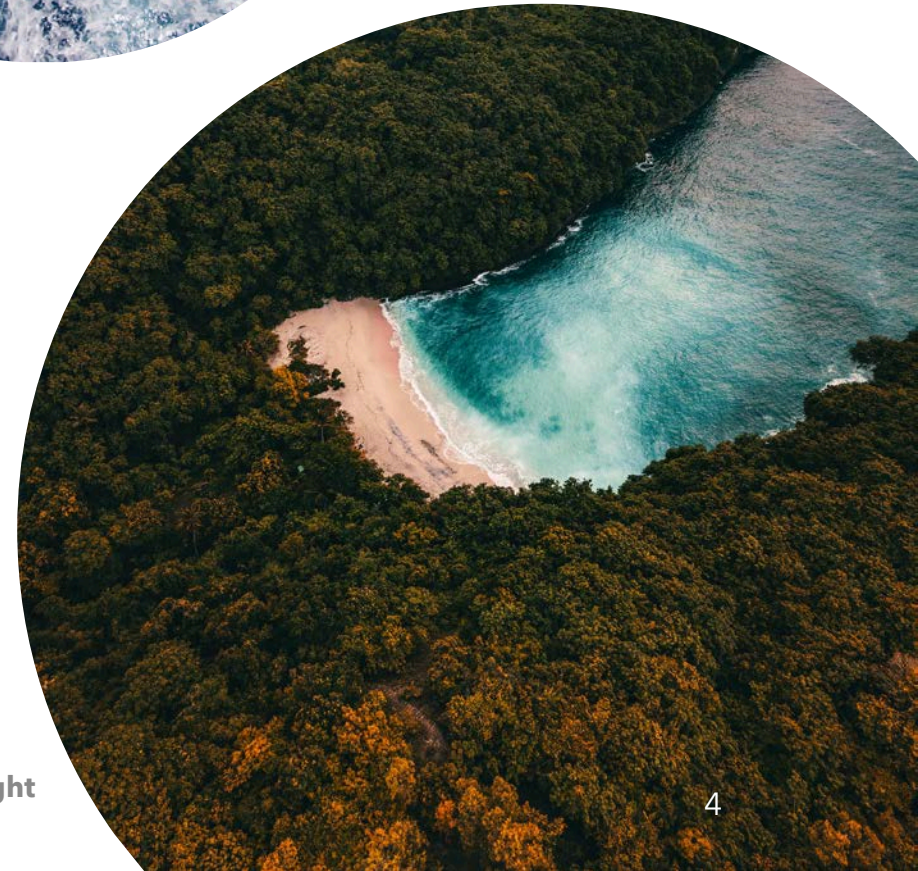
What is Ocean Heat Content?

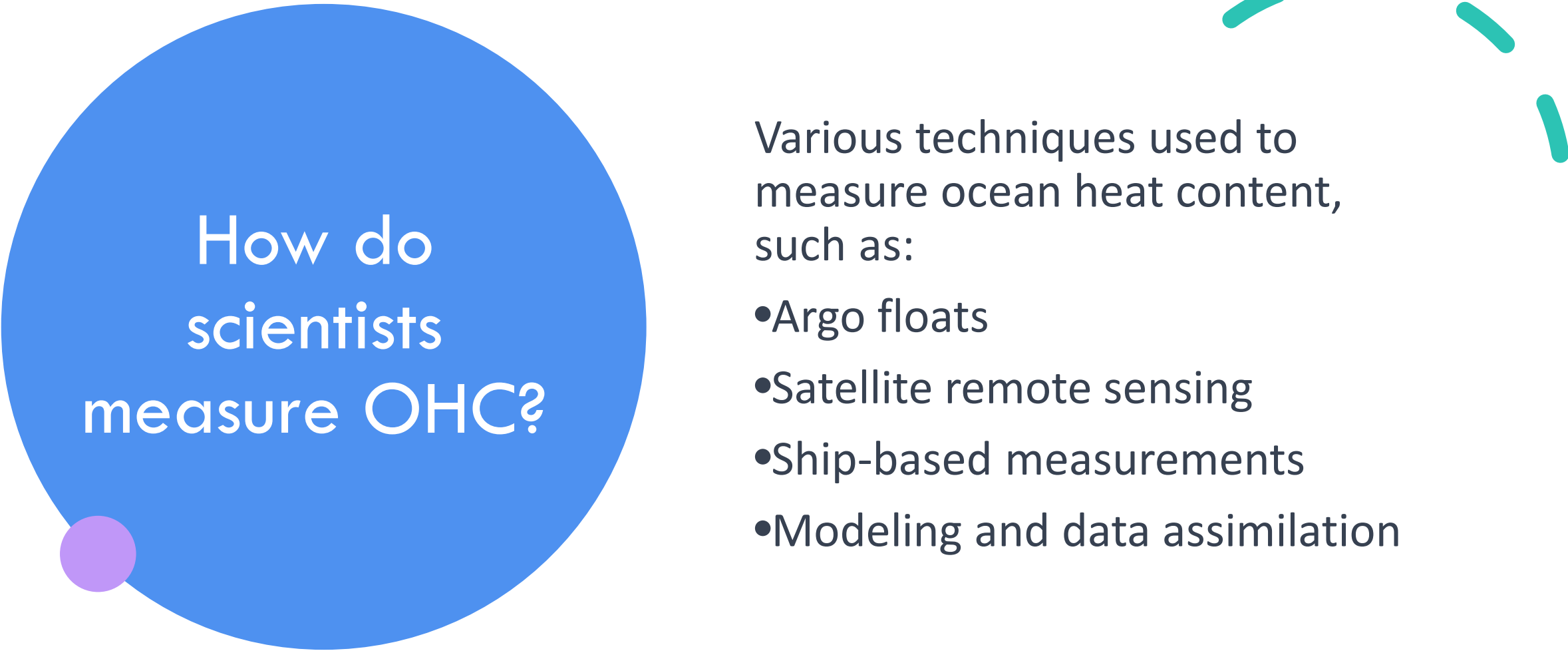
- Ocean Heat Content: Ocean heat content refers to the total amount of heat energy stored in the world's oceans.
- It is a key indicator of Earth's energy balance and climate system
- Units: joules or kilojoules

OCEAN HEAT CONTENT

Main factors that contribute to changes in ocean heat content:

- Solar radiation
- Greenhouse gases
- Ocean currents
- Atmospheric circulation patterns





How do scientists measure OHC?

Various techniques used to measure ocean heat content, such as:

- Argo floats
- Satellite remote sensing
- Ship-based measurements
- Modeling and data assimilation




Implications of changing OHC

- Ocean ecosystems
- Sea level rise
- Ocean acidification
- **Weather patterns**
- **Climate variability**



What are we interested in?

- Long-term trends in ocean heat content
- Regional variations
- The relationship between OHC and climate change
- Relationship between OHC and hurricanes



OHC & Hurricanes: Why is this important?!

Hurricanes are intense tropical cyclones with strong winds and heavy rainfall.

•**Formation:** Low wind shear, atmospheric disturbance and warm ocean waters.

•**Impact:** The destructive power of hurricanes, includes storm surges, high winds, and flooding.

- Fuel for Hurricanes
- Intensity Duration**
- Heat Exchange
- Sea Surface Temperature
- Storm Surge



SEA LEVEL
HEIGHT



What is Sea Level Height?

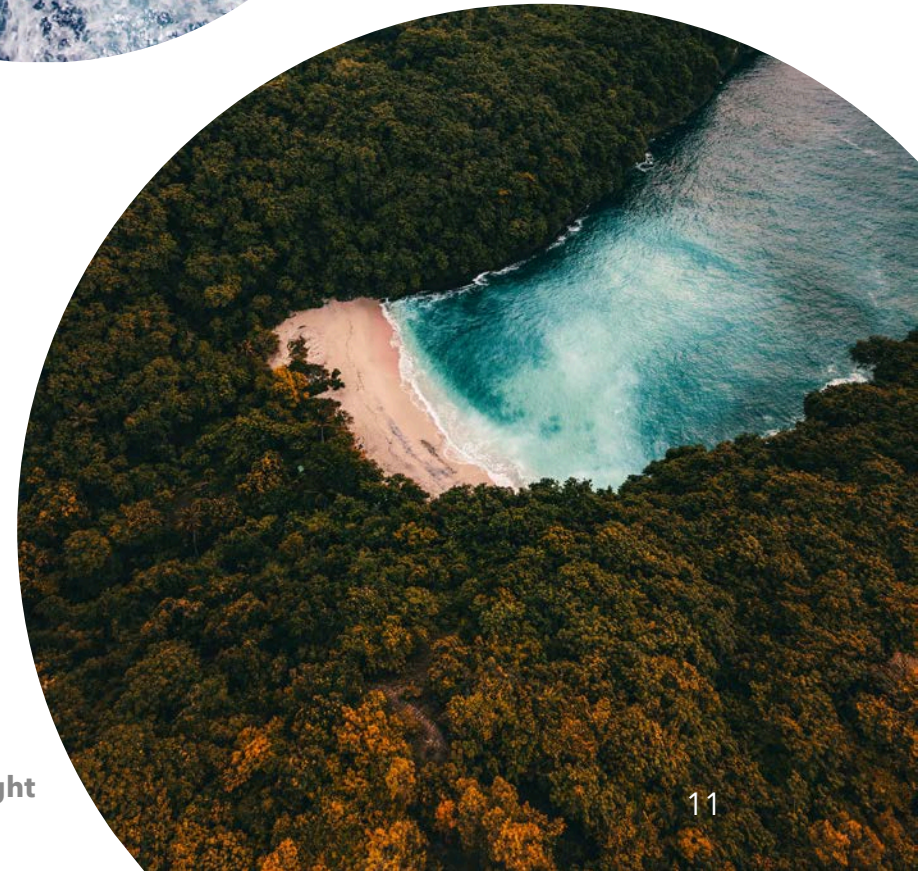
Sea Level Height: Refers to the average height of the ocean's surface to the land


- It is a critical measure for assessing coastal vulnerability and the impacts of storms like hurricanes
- Units: meters, feet

SEA LEVEL HEIGHT

Main factors that contribute to changes in ocean heat content:

- Thermal Expansion
- Melting of land ice
- Changes in ocean circulation





How do scientists measure SLH?

Various techniques used to measure ocean heat content, such as:

- Tide gauges
- Satellite altimetry
- GPS and InSAR



Implications of changing SLH



SLH is important because:

- Climate Change
- Coastal Vulnerability
- Impact on Ecosystems
- Human population and infrastructure



What are we interested in?

- Historical trends
- Regional variations: sea level rise is not uniform globally, with variations across different coastal regions.
- Acceleration of sea level rise

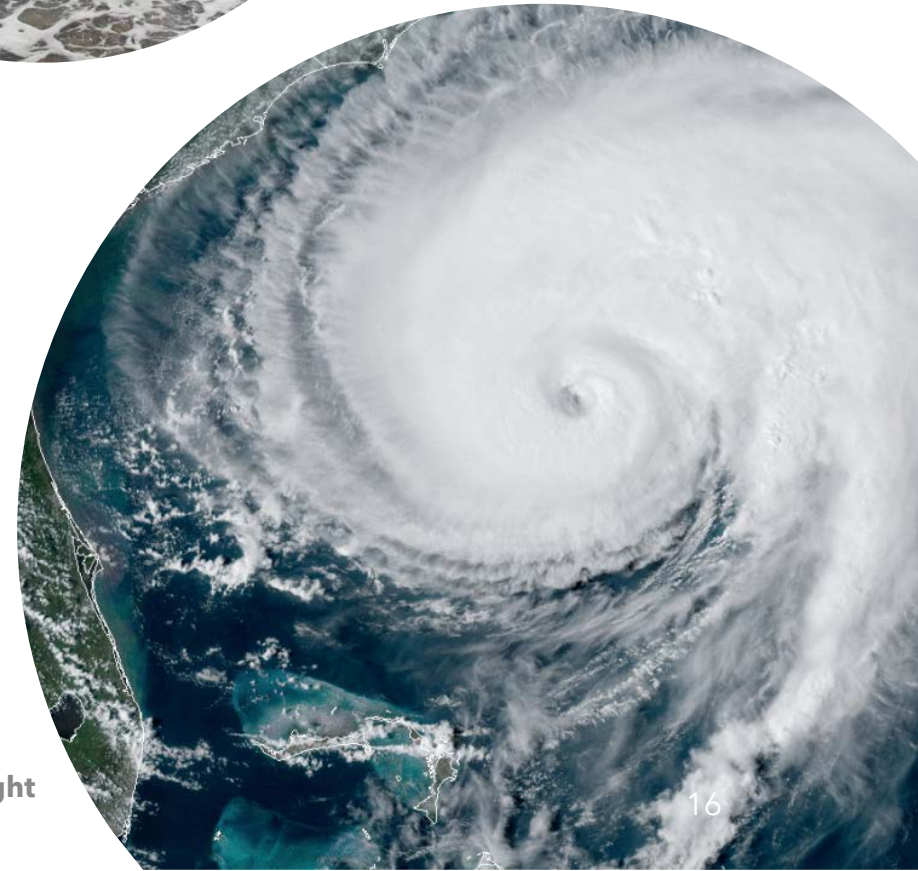


SLH & Hurricanes: Why is this important?!



- Storm Surge: Hurricanes generate storm surges, which are abnormal rises in sea level caused by strong winds and low atmospheric pressure.
- Amplification Effect: Higher sea levels enhance the destructive potential of storm surges, leading to more extensive flooding and coastal erosion.
- Compound Risks: Sea level rise, coupled with storm surges, poses increased risks to coastal areas during hurricanes.


Summary

- It is important to understand and monitor sea level height in relation to hurricanes for effective disaster preparedness and climate resilience.
- Further research, collaboration, and proactive measures to address the challenges posed by the connection between sea level height and hurricanes.



- Ocean Heat Content: Warm ocean waters fuel the intensity and duration of hurricanes, influencing their potential to generate storm surges.
- Climate Change: Global warming and climate change contribute to sea level rise, amplifying the impact of storm surges during hurricanes.
- Topography and Coastal Geomorphology: Coastal features and landforms can exacerbate the effects of storm surges and flooding.

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- The implications of the connection between sea level height and hurricanes for coastal regions: Increased Flooding and Erosion:
 - Heightened risks of coastal flooding, erosion, and infrastructure damage during hurricanes.
 - Vulnerable Communities: The disproportionate impacts on vulnerable populations and coastal communities lacking sufficient adaptive measures.
 - Long-Term Adaptation: There will be a need for long-term planning, resilient infrastructure, and coastal management strategies to mitigate the risks.



The way to get started
is to quit talking and
begin doing.

Walt Disney



Thank you

Keneshia Hibbert

Khibbert@gradcenter.cuny.edu

<https://www.linkedin.com/in/keneshiahibbert/>

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