Nearshore Wave Climatology of the New Jersey Shelf

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Outline

• Introduction to HF radar
• HFR wave measurements during Tropical Storm Ophelia 2023
• Long term wave statistics 2017-2023
• Month long comparisons
High Frequency Radar

CODAR Tx/Rx Antenna
Lewes Beach, DE USA
Surface Currents from SeaSonde HF Radar

Radial Map of Currents

Total Map of Currents
Surface Waves from SeaSonde HF Radar

Radar Comparison of Buoy and CODAR Wave Height (m)
Study Area
Tropical Storm Ophelia 2023
Tropical Storm Ophelia

Sep 22-25, 2023

Note: The cone contains the probable path of the storm center but does not show the size of the storm. Hazardous conditions can occur outside of the cone.

Current information:
- Center location: 35.6 N 77.2 W
- Maximum sustained wind: 50 mph
- Movement: N at 13 mph

Forecast positions:
- Tropical Cyclone
- Post/Potential TC
- Sustained winds: D < 39 mph, 39-73 mph, H 74-110 mph, M > 110 mph

Potential track area:
- Day 1-3
- Day 4-5

Watches:
- Hurricane
- Trop Storm

Warnings:
- Hurricane
- Trop Storm
Wave Heights from NDBC Buoys

44009
44025
44065
44066
44091
Wave Heights (m) from HFR Stations

SPRK

HLGT

2023-09

0 1 2 3 4 5

wave model height in meters (m)

0 20 21 22 23 24 25 26

wave model period in seconds (s)

Data courtesy of Center for Ocean Observing and Leadership, Department of Marine & Coastal Sciences, Rutgers University.
Wave Height Statistics
2017-2023
Wave Measurements 2017-2023, Raw Data

Significant Wave Height from NDBC 44009

Significant Wave Height from HFR Station SPRK
Wave Measurements 2017-2023, Monthly Statistics

Significant Wave Height Statistics 2017-2022 from NDBC 44009

Significant Wave Height Statistics 2017-2022 from HFR Station SPRK
Wave Height Statistics
January - March 2023
Wave Comparison  Jan-Mar 2023
Conclusions

• Provided introduction to HF radar
• Rutgers 13 MHz HF radar stations are providing real time current and wave information
• 5 year climatology of wave height from HFR is comparable to nearby buoy 44009
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Thanks