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THE LESS DESIGNATION COMMENT

### NOAA National Weather

Service

### Wave Goodbye to Old Marine Forecasts and Make Waves at the Beach



#### Jan. 31, 2024

# Melinda Bailey, NWS Marine Program Manager & Wayne Presnell, NWS Marine Program Coordinator





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ANZ451-120400-

Coastal waters from Manasquan Inlet to Little Egg Inlet NJ out 20 nm-

1002 AM EST Thu Jan 11 2024

...SMALL CRAFT ADVISORY IN EFFECT THROUGH LATE TONIGHT... ...STORM WATCH IN EFFECT FROM FRIDAY EVENING THROUGH LATE FRIDAY NIGHT...

.REST OF TODAY...SW winds 10 to 15 kt with gusts up to 20 kt. Seas 4 to 6 ft. SE swell 3 to 4 ft at 9 seconds.

.TONIGHT...SW winds around 15 kt, becoming NW after midnight. Gusts up to 25 kt. Seas 4 to 6 ft. SE swell 2 to 3 ft at 9 seconds.

.FRI...N winds 5 to 10 kt, becoming SE 15 to 20 kt in the afternoon. Seas 2 to 4 ft. SE swell 2 to 3 ft at 8 seconds. A chance of rain in the afternoon.

.FRI NIGHT...SE winds 25 to 30 kt with gusts up to 40 kt, becoming S 30 to 35 kt with gusts up to 50 kt after midnight. Seas 4 to 7 ft, building to 9 to 14 ft after midnight. Rain. .SAT...SW winds 25 to 30 kt with gusts up to 40 kt. Seas 9 to 14 ft, subsiding to 8 to 11 ft in the afternoon. SE swell 7 to 12 ft at 9 seconds, becoming S 5 to 7 ft at 7 seconds in the afternoon.

.SAT NIGHT...W winds 25 to 30 kt with gusts up to 40 kt. Seas 7 to 10 ft. SW swell 5 to 6 ft at 5 seconds.

.SUN...W winds 20 to 25 kt, diminishing to 15 to 20 kt after midnight. Seas 5 to 8 ft, subsiding to 3 to 5 ft.

.MON...W winds 10 to 15 kt. Seas 2 to 3 ft. A chance of snow and rain after midnight.

### Current State of Marine Text Products

- Summarizes conditions; sentence form
- Can be difficult to *quickly* read and easily understand
- Complex weather scenarios may not be accurately reflected (impacts)





### Internet and Satellite Capabilities over the Ocean

#### Now:

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- Not readily available for/from vessels
- Typically expensive

#### Future:

- Availability is increasing over the ocean
- Becoming more affordable and reliable
- NWS marine products will continue to evolve to provide better information.

Legacy dissemination methods -which use radio signal technology -- have to be maintained until internet capabilities over the marine areas match the capabilities over land.





### Future of Marine Forecasts from NWS Forecast Offices



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- Tabular format
- Additional forecast information, such as 100 foot winds, wave detail and occasional waves
- New probabilistic
   Information
- Matrix format
- Easier and faster to read and understand

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	We Sfc 100 Sig Oci	atherN windsN o-ft windsN waves3	lostl shc orth to 2 North 30 8 to 5 mic	y clo wei 10 25 k 15 kno 5 feo nig	oudy rs. to 1 nots to 2 ts at et bu ht.	y wit 5 kr afte 20 k fter i uildi	th a nots er m nots midr ng to	sligi incr idni inc nigh o 5 t	ht cl reas ght. reas t. to 7	ing fing f	to no afte	f sno orthe orth	ow east ieas	20 t to		
								Ju	ino	Bea	ch					
		juno beach														
		EST 3hrly	13	16	12 19	22	01	01/.	07	10	13	16	19			
		Rip Current Risk Rip Probability	High 54	High 48	High 24	High 21	High 37	High 35	Mod 12	Mod	Mod 18	Mod 13	Mod			
		Surf Height (ft)	2	0	0	0	0	0	0	0	0	0	ø			
		Dom Period (s)	5	5	5	5	5	5	5	5	5	5	4			
N		Chance Precip	None	None	None	None	None	10	10 None	30 None	40	40	30 None			
		Cloud Cover	Pcld	Pcld	Pcld	Pcld	Mcld	Mcld	Mcld	Mcld	Cld	Cld	Mcld			
		Temperature	79	80	78	76	75	73	71	74	72	68	65			
~ 2		Heat Index	c 10	84	c 16	C 15	6 21	CH 201	CU 10	11.17	AL 15	11 16	11.15			
		Wind Gust	25	23	5 10	20	5 211	510 20:	24	22	22	10 10	11 15			
								-			-					
		EST 6hrlv	01	01/	14	19	01	n 01/. 07	15	19	01	01/.	10	19	01	01/1/
		Rip Probability	20	24	44	54	76	80	48	43	16	27	16	40	17	32
		Dom Period (s)	1	2	0	2	3	3	2	2	1	0	10	14	14	14
		Chance Precip	50	40	10	5	10	40	40	20	30	40	50	30	20	10
		TSTM Potential	None	None	None	None	None	None	None	None	None	Low	Low	Low	Low	None No
		Temperature Heat Index	C1d 66	C1d 66	Mc1d 69	Mcld 69	Mc1d 69	Mcld 73	Mcld 76	Pcld 76	Pcld 74	Pcld 72	Mc1d 77	Mcld 74	Mc1d 68	PC1d Po 55

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### "Wave Detail" in the Coastal Waters Forecast (experimental)

- The Coastal Waters Forecast (CWF) is a text-based forecast issued by the coastal NWS Weather Forecast Offices (WFOs).
  - One-year <u>experimental period</u> (2022-23), showing side-by-side comparisons of CWF
    - Operational vs. experimental "wave detail" included.
    - 16 coastal marine WFOs participated
    - Feedback from survey respondents was largely positive; in favor.

Original Coastal Waters Forecast	New Coastal Waters Forecast with Wave Detail
MZ354-260815- Vaters from Savannah GA to Altamaha Sound GA out 20 NM, including Grays Reef National Marine Sanctuary- 115 PM EDT Wed May 25 2022 TONIGHTSE winds 10 to 15 kt. Seas 2 to 3 ft. THUSE winds 10 to 15 kt. Seas 2 to 3 ft. THU NIGHTS winds 15 to 20 kt. Seas 3 to 4 ft. A chance of showers and tstms after midnight.	AMZ354-260800- Waters from Savannah GA to Altamaha Sound GA out 20 NM, including Grays Reef National Marine Sanctuary- 319 PM EDT Wed May 25 2022 .TONIGHTSE winds 10 to 15 kt. Seas 2 to 3 ft. Wave Detail: SE 2 ft at 8 seconds and NE 1 ft at 9 seconds. .THUSE winds 10 to 15 kt. Seas 2 to 3 ft. Wave Detail: SE 3 ft at 5 seconds and E 1 ft at 9 seconds. .THU NIGHTS winds 15 to 20 kt. Seas 3 to 4 ft. Wave Detail: SE 4 ft at 5 seconds and E 1 ft at 9 seconds. A chance of showers and tstms after midnight.

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### "Wave Detail" in the Coastal Waters Forecast

- Purpose:
  - Providing greater wave detail in the CWF
  - A more pertinent information on waves (height, period, and direction) is an enhancement for mariners and marine partners.
  - Supports improved decision-making.
- Multiple coexisting waves are common throughout the oceans, each with their own unique height, period, and direction.
- Adding details on each of the waves into the CWF will provide valuable, life-saving information for marine users.
  - This information allows users to grasp the character of the seas they'll be traveling on, much better.



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### Height, Period, Direction Critical to Determine Wave Hazard

- *Current forecast format:* Seas 8-10 ft.
  - Mariner "Seems dangerous, but I got this. I have a big boat."
- <u>Proposed forecast format:</u> SW 8-10 ft at 20 sec.
  - Mariner "Uh oh, that is coming at me? I'm not going anywhere near that inlet."





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### "Wave Detail" in the Coastal Waters Forecast

- Starting May 2024 the terms "Wind Wave" and "Swell" will no longer be used within the CWF.
- Instead, height, direction, and period will be provided for all expected wave groups within the forecast period.





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#### "Wind Wave" and "Swell" terms ž

- Using "Wind wave" and "Swell" (subjective), makes it harder to integrate \*NWPS guidance which is objective.
- These subjective terms also lead to  $\approx$ inconsistency (between offices, and sometimes even between forecasters in the same office).
  - Eliminating these terms allow us to better provide more specific information: height, period, and direction.





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\* NWPS (Nearshore Wave Prediction System)

### Coastal NWS offices who will be adding wave details in their Coastal Waters Forecast text product starting May 2024

Alaska Region WFOs, Guam, and American Samoa will not be adding wave detail. - Needed model data is not available yet.

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The Great Lakes will also not participate. - Waves on the Great Lakes have limited fetch for wind waves. The occurrence rate is very low and short-lived.



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### Surf Zone Product Enhancements into a Matrix

Increased ability to add detail not in the current Surf Zone text forecast.

 NWPS's probabilistic rip current model has improved.

The experimental matrix provides lifeguard/beach services and emergency managers with important information on the timing and location of hazardous surf conditions.

 Enhances public safety decision-making processes.





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### **Experimental Surf Zone Matrix**

- Similar forecast parameters as the current Surf text product
- At select coastal NWS Forecast Offices
- Six-day forecast
- Created for popular beaches
  - Experimental period was completed in the summer of 2022 (<u>PNS 22-21</u>).
  - Results were positive and NWS will be adding additional offices for 2024 beach season.

Juno Beach Lake V	Vorth	Boca R	taton	Pomp	pano Be	ach	Fort L	auderd	ale Bea	ch ł	follywoo	d Bea	ch H	aulove	er Park	Miami Bead
Crandon Park Van	derbilt Be	ach	Naple	s Pier	Marc	o Island	L.									
						Ju	no	Bea	ch							
D-+-		01 /	10			- 01 /1	-									
Date	10	1 01/.	12	2.2	58	01/1	5 07	10	12	10	10					
EST SHELY	15	10	19	22	01	64	01	10	15	16	19					
Rip Current Ris	k High	High	High	High	High	High	Mod	Mod	Mod	Mod	Mod					
Rip Probability	54	48	24	21	37	35	12	9	18	13	6					
Surf Height (ft	) 2	0	0	0	0	0	0	0	0	0	0					
Dom Period (s)	5	5	5	5	5	5	5	5	5	5	4					
Chance Precip	5	0	0	0	0	10	10	30	40	40	30					
TSTM Potential	None	None	None	None	None	None	None	None	Low	Low	None					
Cloud Cover	Pcld	Pcld	Pcld	Pcld	Mcld	Mcld	Mcld	Mcld	Cld	Cld	Mcld					
Temperature	79	80	78	76	75	73	71	74	72	68	65					
Heat Index		84														
Wind (mph)	S 18	5 18	5 16	S 15	5 21	SW 205	W 18	W 17	NW 15	N 16	N 15					
Wind Gust	25	23		20			24	22	22							
_	-						<u></u>		_							
Date	Sur	1 01/:	14		Moi	n 01/1	5		Tu	e 01/	16		Wed	01/	17	
EST 6hrly	01	07	13	19	01	07	13	19	01	07	13	19	01	07	13	
Rip Probability	20	24	44	54	76	80	48	43	16	27	16	40	17	32	17	
Surf Height (ft	) 1	2	0	2	3	3	2	2	1	0	1	2	2	2	3	
Dom Period (s)	7	7	7	7	5	5	5	4	4	4	10	14	14	14	9	
Chance Precip	50	40	10	5	10	40	40	20	30	40	50	30	20	10	5	
TSTM Potential	None	None	None	None	None	None	None	None	None	Low	Low	Low	Low	None	None	
Cloud Cover	Cld	Cld	Mcld	Mcld	Mcld	Mcld	Mcld	Pcld	Pcld	Pcld	Mcld I	Mcld	Mcld	Pcld	Pcld	
Temperature	66	66	69	69	69	73	76	76	74	72	77	74	68	55	61	
Heat Index																
Wind (mph)	NE 13	VE 13	NE 16	<b>NE 16</b>	E 18	E 175	E 16	S 14	5 14	5 14	S 165	W 15	W 16N	W 18	N 17	
Wind Gust			23				23			20	24	23	23	28	26	



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### **Future of Coastal Waters Text Forecast**

.REST OF TODAY...

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WEATHER......Mostly cloudy with scattered showers. Mostly

· TONIGHT · · ·
WEATHERMostly cloudy with isolated showers.
SFC WINDSSouthwest 10 to 15 kt.
100-FT WINDSSouthwest 15 to 20 kt.
SIG WAVES15 to 17 ft / around 5 m /.
10th PERCENTILE12 ft / around 4 m /.
90th PERCENTILE22 ft / around 7 m /.
OCNL WAVES
WAVE GROUP 1SW 6 ft at 6 sec / around 2 m /.
WAVE GROUP 2

- Tabular format for faster reading
- Addition of new, probabilistic Information
- Additional forecast information, such as 100-foot winds and occasional waves
- Larger ships require higher level winds for safe navigation. Providing 100-foot winds along with surface winds will enable mariners to make safer decisions



### **Rip Current Safety and Awareness Videos**

- NWS new rip current safety and awareness videos
- Available from the <u>NWS Rip Current Safety</u> website

NOAA Studio and the NWS created two beach hazard safety videos which focus on the Great Lakes and the Gulf of Mexico. Footage was taken on the beaches in those particular areas for familiarity for the user:

<u>Play it Safe - Gulf Coast</u>
<u>Play It Safe - Great Lakes</u>





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### Rip Current Safety for Gulf Coast Beaches Excerpt Clips





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## **Any Questions?**

## Thank you!

Melinda Bailey (<u>melinda.bailey@noaa.gov</u>) Wayne Presnell (<u>wayne.presnell@noaa.gov</u>)



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