

Marine Weather Impact-Based Decision Support Aboard the NOAA Ship *Nancy Foster* During a Research Expedition Offshore the Florida Keys Kennard B. Kasper and Christopher Rothwell NOAA/National Weather Service, Key West, Florida

Planning Decisions



Observations







DECK LOG - WEATHER OBSERVATION SHEET

hip NANCY FOSTER (K-352) TIME ZONE DAY OF WEEK DATE (dd mmm yyy) 19 AUG2016

24"42.1N 082"59.4W FEW CLF 10 063 55 1018 0-1 090 0-1 29.9 27 28

24-38,1 NOSE-57.5 FEW CLR 10 073 6.9 1017 04 0900-1 09.9 27 25

24" +1. ON US2"57.34 FEW CLP 10 052 8.7 1017 0-1 090 0-1 29.8 27 25

21"13.1" DOSTOSTISIU FEN CER 10 066 8:2 1017.9 0-1 020 0-1 29.9 27 26

24"42.5N 092"57.1W PEW CCR 10 061 7.1 16162 0-1 090 0-1 298 27.5

431.3'N 082°58.8 WSCT UCTS 10 075 6.1 1016.2 0-1 090 0-1 29.8 27.5

2a1a 2a 3a 4a 5a 6a 7a 8a 9a10a | 12p1p 2p 3p 4p 5p 6p 7p 8p 9p10p | 12a

24'35 5'N 553'0274 3KU VILTE 10 084 9,1 10176 6-1 090

24"41.7"N 092"57.0" SET CLIR 10 069 5.7 10162 0-1 090 0-1 29.7 27.5 2

WIND SEA SEA SWELLWAVES TEMPERATUR

weather.gov/key

Marine weather impact-based decision support services were provided by two Florida Keys NWS meteorologists aboard the NOAA research vessel *Nancy Foster*, during a research expedition off the Florida Keys from 14-22 August 2016. [Subsequent to this abstract, Florida Keys NWS meteorologists joined the *Nancy Foster* on her 2017 mission in the Florida Keys.] The expedition was conducted mainly between Key West and the Dry Tortugas in the NOAA Florida Keys National Marine Sanctuary. The NOAA-led research team conducted scuba and small-boat operations, and undertook a variety of research missions, collecting data necessary for management decisions within the Sanctuary.

The Florida Keys NWS meteorologists gave daily shipboard marine weather briefings to support safety of life at sea and weather-sensitive decision making, pertaining to ship and small boat voyage planning and execution, and dive operations. The NWS meteorologists quickly became completely integrated into the daily rhythm of the ship and science operations, participating in the morning safety briefings on the bridge with NOAA Corps commissioned officers, department heads, and the chief scientist. Each day, a weather outlook was drafted and included in the official "Plan of the Day", and subsequently circulated throughout the ship during the late afternoon hours. In addition, NWS meteorologists participated in an evening science team meeting, providing a summary and explanation of the day's weather as it pertained to science operations, as well as the outlook for the next day. Importantly, the 24/7 duty forecasters at the Florida Keys National Weather Service Forecast Office in Key West supported the deployed meteorologists by providing twice daily e-mail briefings and guidance via "NWSChat" software. The deployed meteorologists were supported as (deep) "core partners" of the duty forecasters at the Forecast Office. Such a "service-centric mindset" applied internally (between home-office and deployed personnel) will be essential in the future as collaboration proliferates at all levels of the agency, in support of building a Weather-Ready Nation.

This expedition proved to be a prolific learning experience not only for the NWS scientists involved, but also the other NOAA Corps officers, crew, and scientists. Each deployed NWS meteorologist presented an evening seminar (20-30 minutes) to officers, crew, and scientists, highlighting NWS operations and services and other aspects of the NWS Marine, Tropical, and Tsunami Services Program (e.g., hurricanes). Moreover, the NWS meteorologists observed and directly participated in weather-sensitive operations, communicated with operators, and determined areas for improvement regarding the quality, value, and presentation of NWS weather, water, and climate data, forecasts, and warnings.



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NWSChat software critical for low-bandwidth communication. 6:47:49 AM) **nws-brandon.fling:** Good morning Chris! Caught that mahi at the end of the day, found some sea grass. miles out, evidently it's good place to catch the 6:47:50 AM) nws-sean.daida: morning 6:57:53 AM) nwsNF-chris.rothwell: Morning Sean! 17 6:58:03 AM) nwsNF-chris.rothwell: 2-4 ft, residual swell I) nws-krizia.negron: Good morning, Chris! Sounding winds /2017 7:52:41 AM) nwsNF-chris.rothwell: Good morning Krizia, thank you. 1/2017 8:04:48 AM) nwsNF-chris.rothwell: 21012kt /1/2017 8:05:58 AM) nws-krizia.negron: What's your current location 1/2017 8:08:56 AM) nws-sean.daida: how was last night? You had 4 or 5 hours of near 20 knots 017 8:49:55 AM) nws-chris.rothwell: Restless sleep, the boat does 20 minute transects with the bottom scanner, then does a uand does another transect, rinse and repeat. Several of the science crew remarked about the periodic weightlessness in the ounks, going up and over large wave sets. 1/2017 8:50:01 AM) nws-chris.rothwell: Current location: 017 8:54:02 AM) nws-chris.rothwell: 24.5644, 83.0226 7 8:54:51 AM) nws-chris.rothwell: SW of Loggerhead Key, drop camera boat in the water, ROV operations delayed, trying to the Foster in position, wind and waves hampering that effort 9:00:31 AM) nws-chris.rothwell: Because of our forecast, critical dive operations have been scheduled for tomorrow the expected 'favorable' conditions. Thursday and Friday will need planning based on the expected freshing breezes and ling seas. The Foster has "a broken hip" (acccording to the Captain), and has extreme difficulty holding postion with z-drives bow thruster in seas greater than 4 ft and winds 18 knots or greater. 017 9:04:22 AM) nws-alan.albanese: Chris I just lowered pops from 50 to 30 17 9:17:25 AM) nws-chris.rothwell: ok--agreed--i passed along chances of 30% or less about an hour ago to a member of /2017 9:17:57 AM) nws-chris.rothwell: Convergence zone is north of us--glad it setup there instead of here 17 9:38:03 AM) nws-sean.daida: sorry about not pulling the trigger on lowering pops before end of shift Alan and Chris. 7 9:41:55 AM) nws-sean.daida: I'm guessing you guys were seeing short period 5's and maybe a few 6's through those night . What's a broken hip? Did something break? 17 9:46:44 AM) nws-krizia.negron: Summary of winds and rainfall from yesterday was sen 17 9:50:59 AM) nws-chris.rothwell: Three generators, one is down. Means there is no backup now. The second being used is pared for the amperage for the z-drives and bow thruster. 7 9:51:48 AM) nws-sean.daida: wow that sounds somewhat sketchy. 017 10:43:19 AM) nws-chris.rothwell: 21010KT, 2 to 3 ft occasional 4's 017 11:47:06 AM) nws-chris.rothwell: 18009K /2017 11:47:35 AM) nws-david.ross: Thanks, Chris 1/2017 12:48:43 PM) nws-chris.rothwell: 19009KT





7 12:50:32 PM) nws-krizia.negron: Thanks







Operational Decisions

Education

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Explore the *Nancy Foster*.

Learn about NOAA collaboration in the Florida Keys.



Watch a YouTube video from the 2016 *Nancy Foster* expedition

