

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



DCA22PM034

METEOROLOGY

Specialist's Factual Report

November 3, 2022

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A. ACCIDENT

Location: Vega Baja, Puerto Rico
Date: August 8, 2022
Time: 1417 Atlantic standard time (1817 UTC¹)
Vessel: *Winslow Griesser*

B. METEOROLOGY INVESTIGATOR

Mike Richards
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C. DETAILS OF THE INVESTIGATION

The National Transportation Safety Board's meteorological specialist did not travel in support of this accident investigation and gathered all weather data remotely. Unless otherwise noted, all times are in Atlantic standard time for August 8, 2022 (based upon the 24-hour clock), directions are referenced to true north, distances are in nautical miles and heights are above mean sea level (msl). The accident site was located at about: 18.538333° north latitude; 66.296667° west longitude at msl.

This report provides information on the weather conditions and forecasts applicable to the accident time and location.

D. WEATHER INFORMATION

1.0 Surface Observations

An Automated Surface Observing System (ASOS) was located at Luis Munoz Marin International Airport (TJSJ) which was in San Juan, Puerto Rico, about 18 miles east-southeast of the accident location at an elevation of about 10 feet. It had a magnetic variation of about 13° west. Augmented longline² reports from the TJSJ ASOS during

¹ UTC - abbreviation for Coordinated Universal Time

² "Longline" refers to the dissemination of weather observations with the intent that they are available in near-real time to national databases (effectively, the whole world) and accessible to the general global public from a large number of vendors. This does not include public accessibility to observations from

the times surrounding the accident time are presented here, and the observation closest in time to the accident time is highlighted by bold text.

[1256] METAR TJSJ 081656Z 07016G26KT 9SM FEW028 SCT045 SCT055 32/23
A3000 RMK AO2 PK WND 09027/1639 SLP159 HZ ALQDS T03170233=

**[1356] METAR TJSJ 081756Z 07018G23KT 10SM FEW030 SCT060 32/25
A2998 RMK AO2 PK WND 08026/1712 SLP152 T03170250 10322
20289 58015=**

[1456] METAR TJSJ 081856Z 06018KT 10SM FEW038 SCT060 SCT080 31/23
A2997 RMK AO2 PK WND 07026/1819 SLP148 T03110233=

At 1356, the TJSJ ASOS reported a wind from 070° at 18 knots with gusts to 23 knots, visibility 10 statute miles or greater, few clouds at 3,000 feet above ground level (agl), scattered clouds at 6,000 feet agl, temperature of 32° Celsius (C) (89° Fahrenheit [F]) and dew point temperature of 25°C (77°F), altimeter setting of 29.98 inches of mercury; Remarks included: automated station with a precipitation discriminator, peak wind from 080° at 26 knots at 1312, sea level pressure of 1015.2 hectopascals, temperature of 31.7°C and dew point temperature of 25.0°C.

2.0 Weather Radar

WSR-88D³ Level-II base reflectivity weather radar imagery from the Puerto Rico site (TJUA) is presented in Figure 1. TJUA was located approximately 28 miles southeast of the accident location with an antenna elevation of about 2,960 feet. Assuming standard refraction and considering the 0.95° beam width⁴ for the WSR-88D radar beam, the TJUA 0.483° tilt would have “seen” altitudes above the accident location of between about 3,500 and 6,300 feet. Figure 1 indicates that there were no significant radar echoes immediately around the accident location at the accident time.

a reporting station’s Very High Frequency (VHF; line-of-site) or telephone broadcast, where applicable. Longline-dissemination of weather observations is the primary vehicle through which the general global public has access to surface weather observations, particularly outside of the aviation community.

³ Weather Surveillance Radar 88 Doppler (WSR-88D)

⁴ Here we define the angular width of the radar beam as the region of transmitted energy that is bounded by one-half the maximum power. The maximum power lies along the beam centerline and decreases outward from the radar antenna.

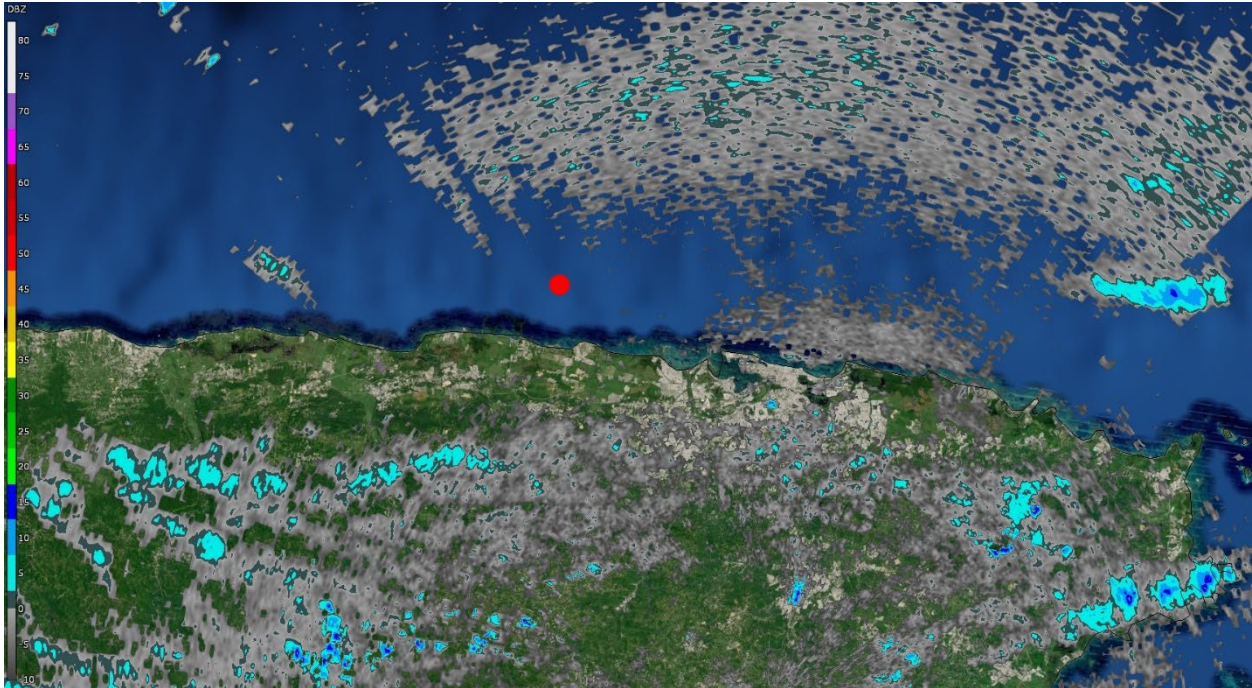


Figure 1 - TJUA 0.483° Level-II base reflectivity product from a sweep initiated at 1418. Accident location denoted by the red dot. Reflectivity has been “smoothed.”

3.0 Satellite Imagery

Geostationary Operational Environmental Satellite (GOES)-16 visible (0.64 μ m) data were obtained from an archive at the Space Science Engineering Center at the University of Wisconsin-Madison. Imagery from 1416 is presented in Figure 2. The GOES-16 visible imagery depicted clear conditions immediately over the accident location.

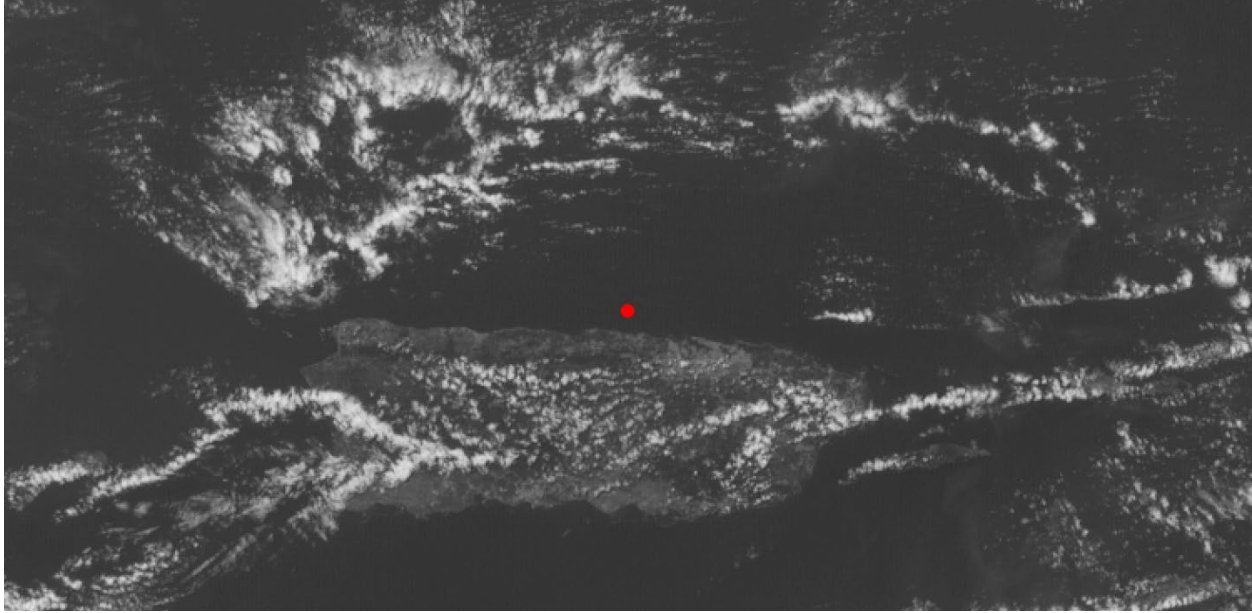


Figure 2 - GOES-16 visible imagery from 1416. Accident location denoted by the red dot. Image is not corrected for parallax error.

4.0 Buoy Observations

Buoy station 41121 was owned and operated by the Caribbean Integrated Coastal Ocean Observing System and was located 23 miles west of the accident location where the water had a depth of 105 feet. Some wave information retrieved by the buoy during times surrounding the accident time are presented here (where wave height is presented in meters).⁵

| <u>Time</u> | <u>Wave Height</u> | <u>Mean Wave Direction</u> |
|-------------|--------------------|----------------------------|
| 0726 | 1.63 | 053° |
| 0756 | 1.69 | 053° |
| 0826 | 1.78 | 052° |
| 0856 | 1.72 | 049° |
| 0926 | 1.79 | 052° |
| 0956 | 1.85 | 050° |
| 1026 | 1.90 | 053° |
| 1056 | 1.77 | 050° |
| 1126 | 1.78 | 052° |
| 1156 | 1.77 | 050° |

⁵ Further buoy information and data may be found here:
https://www.ndbc.noaa.gov/station_page.php?station=41121

| | | |
|------|------|------|
| 1226 | 1.78 | 050° |
| 1256 | 1.83 | 052° |
| 1326 | 1.78 | 052° |
| 1356 | 1.78 | 050° |
| 1426 | 1.79 | 050° |
| 1456 | 1.76 | 050° |

5.0 Ship Reports

Ship reports that provided wind information in the accident region⁶ between 1300 and 1500 were retrieved from the National Centers for Environmental Information (via the National Center for Atmospheric Research)⁷ and are presented below (where wind magnitude is in knots).

| <u>Time</u> | <u>Latitude</u> | <u>Longitude</u> | <u>Wind Direction</u> | <u>Wind Magnitude</u> |
|-------------|-----------------|------------------|-----------------------|-----------------------|
| 1727 | 18.45 | -66.1 | 099° | 12.1 |
| 1749 | 18.45 | -66.1 | 120° | 8.0 |
| 1755 | 18.45 | -66.1 | 118° | 8.0 |
| 1758 | 18.45 | -66.1 | 115° | 8.0 |
| 1858 | 18.45 | -66.1 | 118° | 11.1 |

6.0 Area Forecast Discussion

The National Weather Service (NWS) Weather Forecast Office (WFO) in Miami, Florida, issued the following Marine section of an Area Forecast Discussion at 1245.

*FXCA62 TJSJ 081645 CCA
AFDSJU
Area Forecast Discussion...CORRECTED
National Weather Service San Juan PR
Issued by National Weather Service Miami FL
1245 PM AST Mon Aug 8 2022*

.MARINE...

The forecast was adjusted upward (about half foot up) for the first 24 hrs to match the current observations. The most recent observations from the offshore

⁶ Ship reports were queried for a geographic area bounded by latitudes 19.0°N and 18.0°N, and longitudes 67.0°W and 65.0°W.

⁷ <https://rda.ucar.edu/datasets/ds548.0/>

Atlantic buoy had seas up to 8 feet, and around 5 feet for the nearshore buoys. Breezy conditions will persist today out of the east at 15 to 20 knots, and seas will be choppy up to 6 feet for most of the local waters, and up to 7 feet for the offshore Atlantic waters.

There is a high rip current risk for the northern coast of Puerto Rico, Culebra, and for St. Croix.

7.0 Coastal Waters Forecast

The NWS WFO in Miami, Florida, issued the following Coastal Waters Forecast, which was applicable to the accident site at the accident time, at 1106.

FZCA52 TJSJ 081506

CWFSJU

Coastal Waters Forecast

National Weather Service San Juan PR

Issued by National Weather Service Miami FL

1106 AM AST Mon Aug 8 2022

Puerto Rico and the U.S. Virgin Islands Waters

Seas are provided as a range of the average height of the highest 1/3 of the waves...Along with the occasional height of the average highest 10 percent of the waves.

AMZ700-090330-

1106 AM AST Mon Aug 8 2022

.SYNOPSIS FOR PUERTO RICO AND THE U.S. VIRGIN ISLANDS WATERS...

Surface high pressure over the western Atlantic will promote moderate to locally fresh easterly winds. This will maintain choppy seas through at least mid-week. A weak tropical wave will approach the Lesser Antilles by Wednesday, increasing the potential for shower activity.

AMZ712-090330-

Coastal Waters of Northern Puerto Rico out 10 NM-

1106 AM AST Mon Aug 8 2022

...SMALL CRAFT SHOULD EXERCISE CAUTION...

.REST OF TODAY...East winds 15 to 20 knots. Seas 4 to 6 feet with occasional seas up to 8 feet. Light swells. Scattered showers. Isolated thunderstorms this afternoon.

.TONIGHT...East winds 15 to 20 knots. Gusts up to 30 knots. Seas 4 to 6 feet with occasional seas up to 8 feet. Light swells. Scattered showers.

.TUESDAY...East winds 15 to 20 knots. Seas 3 to 6 feet with occasional seas up to 7 feet. Light swells. Scattered showers. Isolated thunderstorms in the afternoon.

.TUESDAY NIGHT...East winds 15 to 20 knots. Gusts up to 30 knots. Seas 3 to 6 feet with occasional seas up to 7 feet. Light swells. Scattered showers with isolated thunderstorms.

.WEDNESDAY...East winds 15 to 20 knots. Gusts up to 30 knots. Seas 3 to 6 feet with occasional seas up to 7 feet. Light swells. Isolated thunderstorms through the day. Scattered showers.

.THURSDAY...East winds 15 to 20 knots. Seas 3 to 6 feet with occasional seas up to 7 feet. Light swells. Isolated showers.

.FRIDAY...East winds 15 to 20 knots. Seas 3 to 6 feet with occasional seas up to 7 feet. Light swells. Isolated showers.

8.0 Hazardous Weather Outlook

The NWS issued the following Hazardous Weather Outlook at 0555.

*FLCA42 TJSJ 080955 CCA
HWOSJU
Hazardous Weather Outlook...CORRECTED
National Weather Service San Juan PR
555 AM AST Mon Aug 8 2022*

*AMZ710>745-PRZ001>013-090915-
San Juan and Vicinity-Northeast-Southeast-Eastern Interior-North Central-
Central Interior-Ponce and Vicinity-Northwest-Western Interior-Mayaguez and
Vicinity-Southwest-Culebra-Vieques-The nearshore and off shore Atlantic and
Caribbean Coastal Waters-
555 AM AST Mon Aug 8 2022*

This Hazardous Weather Outlook is for Puerto Rico and the adjacent Atlantic Coastal Waters.

.Day One...Today and Tonight

.Lightning...Isolated thunderstorms possible mainly across the west interior sections of Puerto Rico. Be aware of thunderstorms in your area and be prepared to take shelter.

.Excessive Rainfall...Ponding of water in roads and poorly drained areas mainly across the west interior and portions of the west coastal municipalities of Puerto Rico.

.Excessive Heat...Heat index 108-111 degrees possible across north central to San Juan vicinity Puerto Rico, and isolated areas of the remaining coastal municipalities. Heat exhaustion likely with prolonged exposure. Heat stroke possible.

.Wind...Unsecured items could blow around.

.Marine Conditions...Seas equal or greater than 7 feet across the offshore Atlantic waters and the Anegada passage. Hazardous conditions for small craft.

.Rip Currents...Life-threatening rip currents are likely in the surf zone particularly across all the north and some east coast beaches and also in easternmost beaches of Culebra and Vieques.

.Days Two through Seven...Tuesday through Sunday

Life-threatening rip currents possible over the next few days. Maximum Heat index values in the low 100s are possible each afternoon for the next several days. On Tuesday into Wednesday a wind surge will bring enhanced shower and isolated thunderstorm activity to the region, leading to an increased risk of excessive rainfall and lightning. A tropical wave will increase the potential for flooding on Saturday and possibly on Sunday.

.Spotter information statement...

Spotter activation is not anticipated.

Submitted by:

Mike Richards
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