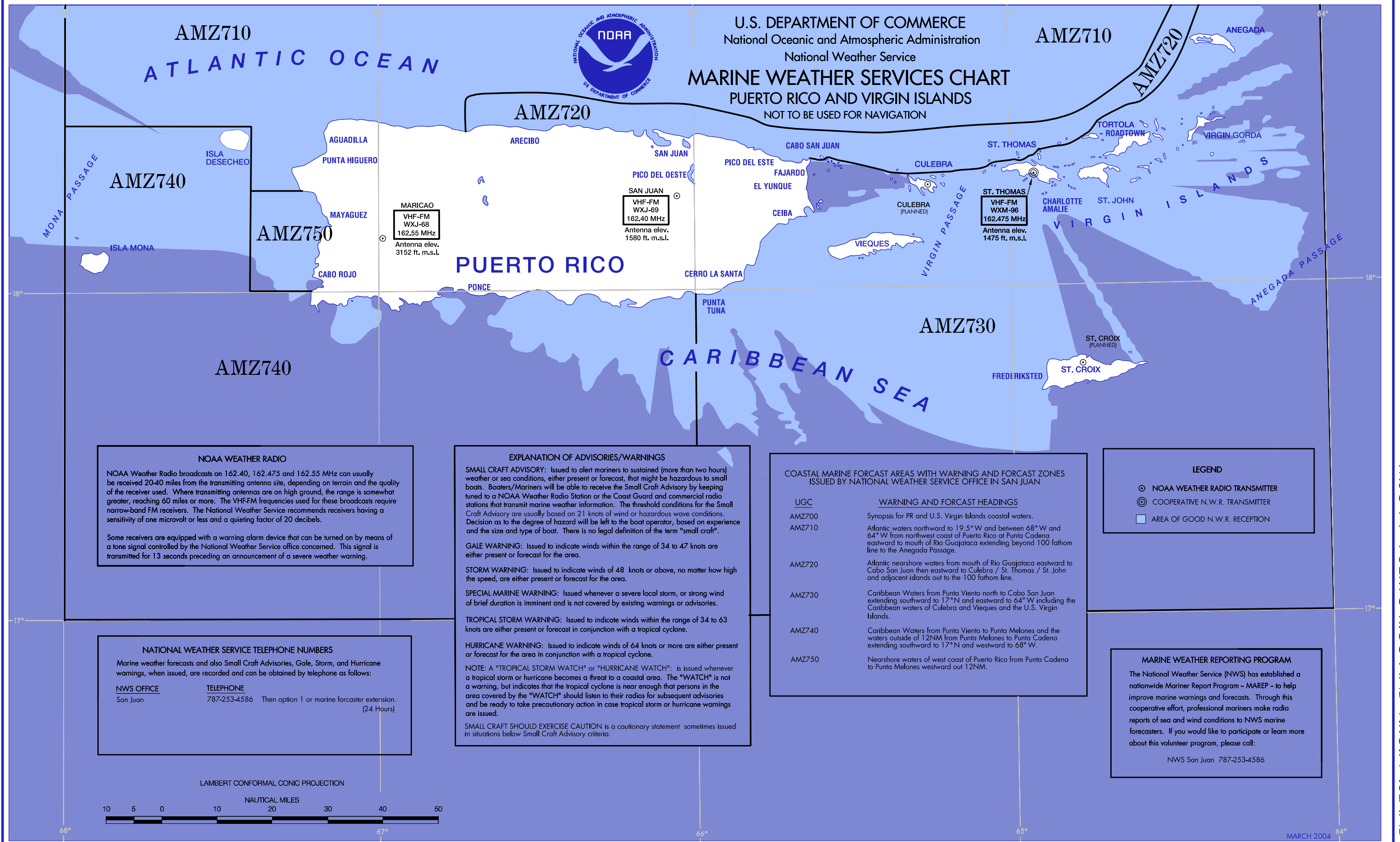


U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Weather Service

MARINE WEATHER SERVICES CHART PUERTO RICO AND VIRGIN ISLANDS

NOT TO BE USED FOR NAVIGATION



NOAA WEATHER RADIO

NOAA Weather Radio broadcasts on 162.40, 162.475 and 162.55 MHz can usually be received 20-40 miles from the transmitting antenna site, depending on terrain and the quality of the receiver used. Where transmitting antennas are on high ground, the range is somewhat greater, reaching 60 miles or more. The VHF-FM frequencies used for these broadcasts require narrow-band FM receivers. The National Weather Service recommends receivers having a sensitivity of one microvolt or less and a quieting factor of 20 decibels.

Some receivers are equipped with a warning alarm device that can be turned on by means of a tone signal controlled by the National Weather Service office concerned. This signal is transmitted for 13 seconds preceding an announcement of a severe weather warning.

EXPLANATION OF ADVISORIES/WARNINGS

SMALL CRAFT ADVISORY: Issued to alert mariners to sustained (more than two hours) weather or sea conditions, either present or forecast, that might be hazardous to small boats. Boaters/Mariners will be able to receive the Small Craft Advisory by keeping tuned to a NOAA Weather Radio Station or the Coast Guard and commercial radio stations that transmit marine weather information. The threshold conditions for the Small Craft Advisory are usually based on 21 knots of wind or hazardous wave conditions. Decision as to the degree of hazard will be left to the boat operator, based on experience and the size and type of boat. There is no legal definition of the term "small craft".

GALE WARNING: Issued to indicate winds within the range of 34 to 47 knots are either present or forecast for the area.

STORM WARNING: Issued to indicate winds of 48 knots or above, no matter how high the speed, are either present or forecast for the area.

SPECIAL MARINE WARNING: Issued whenever a severe local storm, or strong wind of brief duration is imminent and is not covered by existing warnings or advisories.

TROPICAL STORM WARNING: Issued to indicate winds within the range of 34 to 63 knots are either present or forecast in conjunction with a tropical cyclone.

HURRICANE WARNING: Issued to indicate winds of 64 knots or more are either present or forecast for the area in conjunction with a tropical cyclone.

NOTE: A "TROPICAL STORM WATCH" or "HURRICANE WATCH": is issued whenever a tropical storm or hurricane becomes a threat to a coastal area. The "WATCH" is not a warning, but indicates that the tropical cyclone is near enough that persons in the area covered by the "WATCH" should listen to their radios for subsequent advisories and be ready to take precautionary action in case tropical storm or hurricane warnings are issued.

SMALL CRAFT SHOULD EXERCISE CAUTION is a cautionary statement sometimes issued in situations below Small Craft Advisory criteria.

COASTAL MARINE FORECAST AREAS WITH WARNING AND FORECAST ZONES ISSUED BY NATIONAL WEATHER SERVICE OFFICE IN SAN JUAN

UGC	WARNING AND FORECAST HEADINGS
AMZ700	Synopsis for PR and U.S. Virgin Islands coastal waters.
AMZ710	Atlantic waters northward to 19.5°W and between 68°W and 64°W from northwest coast of Puerto Rico at Punta Cadena eastward to mouth of Rio Guajataca extending beyond 100 fathom line to the Anegada Passage.
AMZ720	Atlantic nearshore waters from mouth of Rio Guajataca eastward to Cabo San Juan then eastward to Culebra / St. Thomas / St. John and adjacent islands out to the 100 fathom line.
AMZ730	Caribbean Waters from Punta Viento north to Cabo San Juan extending southward to 17°N and eastward to 64°W including the Caribbean waters of Culebra and Vieques and the U.S. Virgin Islands.
AMZ740	Caribbean Waters from Punta Viento to Punta Melones and the waters outside of 12NM from Punta Melones to Punta Cadena extending southward to 17°N and westward to 68°W.
AMZ750	Nearshore waters of west coast of Puerto Rico from Punta Cadena to Punta Melones westward out 12NM.

LEGEND

- ⊙ NOAA WEATHER RADIO TRANSMITTER
- ⊕ COOPERATIVE N.W.R. TRANSMITTER
- AREA OF GOOD N.W.R. RECEPTION

NATIONAL WEATHER SERVICE TELEPHONE NUMBERS

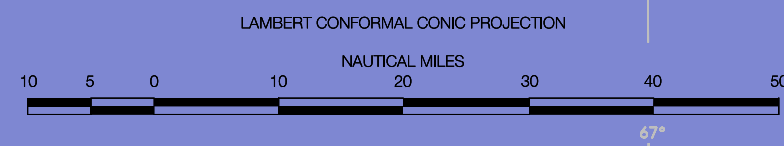
Marine weather forecasts and also Small Craft Advisories, Gale, Storm, and Hurricane warnings, when issued, are recorded and can be obtained by telephone as follows:

NWS OFFICE	TELEPHONE
San Juan	787-253-4586 Then option 1 or marine forecaster extension. (24 Hours)

MARINE WEATHER REPORTING PROGRAM

The National Weather Service (NWS) has established a nationwide Mariner Report Program - MAREP - to help improve marine warnings and forecasts. Through this cooperative effort, professional mariners make radio reports of sea and wind conditions to NWS marine forecasters. If you would like to participate or learn more about this volunteer program, please call:

NWS San Juan 787-253-4586



NOAA WEATHER RADIO BROADCASTS

CITY	STATION	FREQUENCY	BROADCAST TIMES
1. San Juan, PR	WXJ-69	162.40 MHz	Continuously, 24 hrs a day
2. Maricao, PR	WXJ-68	162.55 MHz	Continuously, 24 hrs a day
3. St. Thomas, V.I.	WXM-96	162.475 MHz	Continuously, 24 hrs a day

These VHF-FM radio stations (1 AND 2), locations shown on the map, are managed by the National Weather Service. VHF-FM radio station 3, shown on map, is a cooperative N.W.R. station. Broadcast tapes are updated frequently and amended as required.

The contents vary, but in general contain the following information:

1. Special bulletins and statements concerning hurricanes or other severe weather.
2. Forecasts and warnings for nearby coastal areas.
3. Forecasts for local areas.
4. Description of weather patterns affecting the region.
5. Tide and sunrise-sunset data.
6. Daily climatology.
7. Short-term forecasts.
8. Other information as available.

BROADCASTS OF MARINE WEATHER FORECASTS AND WARNINGS BY MARINE RADIOTELEPHONE STATIONS

CITY	STATION	FREQUENCY (kHz)	BROADCAST TIMES
San Juan, PR	NMR-1 (USCG)	157.1 MHz (ch. 22)	1210, 2210 GMT
Portsmouth, VA	SSBHF	2670	0305, 1505 GMT
		4428.7	0400, 0530, 1000 GMT
		6506.4	
San Juan, PR	NMR-1 (USCG)	6506.4	1130, 2330, 1600 GMT
		8765.4	
		13113.2	
		8765.4	1730 GMT
San Juan, PR	NMR-1 (USCG)	17307.3 (NAVTEX RADIOTELETYPE PRINTER)	
		518	0200, 0600, 1000, 1400, 1800, 2200 GMT

SPECIAL BROADCASTS OF WARNING AND FORECAST MESSAGES

City	Station	Freq. (kHz)	Broadcast times
Charlotte Amalie	WAH	401 - 4357 KHz	6:00 am, 2:00 pm, 10:00 pm
St. Thomas, V.I.		604 - 6510 KHz	
		804 - 8728 KHz	

VHF CH85 - 161.875 MHz 8:00 am and pm

San Juan, PR	NMR-1 (USCG)	157.1 MHz (ch. 22)*
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*Preceded by announcement on 156.8 MHz (ch. 16)

AM AND FM RADIO STATIONS BROADCASTING MARINE WEATHER FORECASTS AND WARNINGS

City	Station	Freq. AM/FM kHz/MHz
Bayamon, PR	WLUZ	1600
Bayamon, PR	WRSJ-FM	100.7
San Juan, PR	WBMJ	1190
San Juan, PR	WOSO*	1030
San Juan, PR	WFOA	870
San Juan, PR	WKVM	810
San Juan, PR	WQBS	630
San Juan, PR	WKAQ	580

Note: Not all broadcasts are in English.

Aguadilla, PR	WABA	850
	WIVA-FM	100.3
Arecibo, PR	WCMN	1280
Caguas, PR	WPRM-FM	98.5
Cayey, PR	WLEY	1080
Camuy, PR	WCHQ	1360
	WCHQ-FM	102.9
Fajardo, PR	WMDD	1480
	WMDD-FM	96.5
Humacao, PR	WALO	1240
Isabela, PR	WISA	1390
	WISA-FM	101.5
Mayaguez, PR	WKJB	710
	WKJB-FM	99.1
Mayaguez, PR	WORA	760
	WORA-FM	97.5
Mayaguez, PR	WTIL	1300
	WOYE-FM	94.1
Ponce, PR	WISO	1260
Ponce, PR	WLEO	1170
Ponce, PR	WEUC	1420
San German, PR	WRSG	1090
San Juan, PR	WIPR	940
	WIPR-FM	91.3
San Sebastian, PR	WFBA	1460
Utua, PR	WUPR	1530
	WUPR-FM	104.1
Viesques Island, PR	WIVV	1370
Yauco, PR	WKFE	1550

St. Thomas, V.I.	Weatherline phone # 774-4786	
Charlotte Amalie,	WGOD	1090
Charlotte Amalie,	WSTA	1340
Charlotte Amalie,	WYWI*	1000

St. Croix, V.I.		
Christiansted,	WSTX	970
Christiansted,	WAVI-FM	93.5
Christiansted,	WKJC-FM	95.1
Fredericksted,	WVRA	1290

* English only broadcasts

ANCHORAGES

Under ordinary conditions the first requirement for anchorage is shelter from the easterly trade winds. Anchorages in Puerto Rico are numerous except along the north coast. Strong northeasterly winds and heavy seas may occur from November to April. During the hurricane season strong winds may strike from any direction. The best hurricane harbors are the Bays (Bahias) of San Juan, Guanica, Guayanilla, Jobos, Salinas and Puerto Real, Cabo Rojo, Ensenada Honda on Culebra Island, and Coral Bay, St. John.

WIND

One of the most outstanding features of the wind in Puerto Rico and the U.S. Virgin Islands is the steadiness of the trade winds. They typically blow, with few and brief exceptions, from an easterly direction, i.e., between northeast and southeast. Local effects caused by these winds flowing around and over the mountainous terrain of the local islands can produce wind and sea conditions differing significantly from those conditions otherwise prevailing across the region. These varying conditions can often be found in the local passes and channels, both large and small, between the numerous islands. Wind across the open waters does not vary between night and day, while across the near shore and protected waters it can vary greatly.

Significantly lighter wind and smoother seas are generally found from the early morning hours through one or two hours after sunrise across protected and near shore waters, with the wind gradually increasing to the prevailing off shore conditions by late morning. This cycle then begins to repeat itself after sunset, with near shore wind gradually diminishing through the early morning hours. Also, the prevailing trade wind flow can become enhanced or increased, due to daytime heating, along the coastlines parallel to the this flow, i.e., usually the north and south coasts. This phenomenon is most evident during the warmest days and months of the year and occurs predominantly along the coasts of the larger islands of Puerto Rico and St. Croix.

Wind speeds across the open waters average about 13 to 15 knots during the Winter and Spring months and slightly less during the remainder of the year. However, migratory high pressure systems building off the east and southeast coast of the U.S. behind cold fronts during the Winter and Spring can produce sustained winds of 20 to 30 knots that may endure for several days. These wind patterns are usually maximized during the Winter from December through March. Gale force winds are rare across the area and winds of this strength and greater may be found during the Summer and early Fall season when they may accompany passing hurricanes, tropical storms, or strong tropical waves.

WEATHER RULES FOR SAFE BOATING

Before setting out:

Obtain the latest available weather forecast for the boating area. The NOAA Weather Radio continuous broadcasts (VHF-FM) are the best way to keep informed of expected weather and sea conditions. If you hear on the radio that warnings are in effect, don't venture out on the water unless you are confident that your boat can be navigated safely under forecast conditions of wind and sea.

While afloat:

1. Keep a weather eye out for: the approach of dark, threatening clouds, which may foretell a squall or thunderstorm; any steady increase in wind or sea; any increase in wind velocity opposite in direction to a strong tidal current. A dangerous rip tide condition may form steep waves capable of broaching a boat.
2. Check radio weather broadcasts for the latest forecasts and warnings.
3. Heavy static on your AM radio may be an indication of nearby thunderstorm activity.
4. If a thunderstorm catches you while afloat, you should remember that not only gusty winds but also lightning pose a threat to safety.
 - stay below deck if possible.
 - keep away from metal objects that are not grounded to the boat's protection system.
 - don't touch more than one grounded object at the same time (or you may become a shortcut for electrical surges passing through the protection system).
 - put on a life jacket and prepare for rough sea conditions.
5. Waterspouts are common across the Northeastern Caribbean. If you observe a waterspout, do not try to outrun it. Steer perpendicular to it and away from its direction of movement.

RADIO WWW/WWWH STORM INFORMATION BROADCASTS

HIGH SEAS STORM INFORMATION for the North Atlantic and North Pacific is provided mariners through a cooperative program of two Department of Commerce agencies: National Weather Service of the National Oceanic and Atmospheric Administration and the National Institute of Standards and Technology. Bulletins are compiled by the National Weather Service and broadcast every hour by the National Institute of Standards and Technology's Frequency and Time Broadcast Services Radio Stations - WWW, Fort Collins, Colorado and WWWH, Kauai, Hawaii. These are the stations that sailors and others listen to for daily time checks.

WWW (FORT COLLINS, CO)
FREQUENCIES : 2.5, 5, 10, 15, 20 MHz

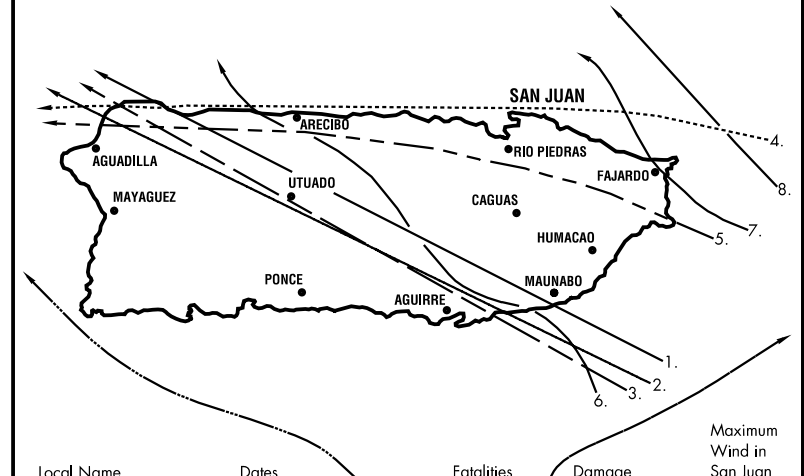
The weather broadcast is in 45-second segments separated by a 15-second interval.

TIMES OF BROADCAST	BROADCAST AREA
8 minutes past the hour	Storm information for western North Atlantic,
9 minutes past the hour	including Gulf of Mexico and Caribbean Sea.

TROPICAL CYCLONES

Hurricanes and tropical storms are an important feature of Puerto Rico and U. S. Virgin Islands climate during Summer and early Autumn. The tropical cyclone season in the North Atlantic region extends from June through November. Because of seasonal shifts in favored locations of tropical cyclone development, the Puerto Rico-Virgin Islands area is outside the main paths of these most severe tropical atmospheric disturbances, except from August through the first half of October. A few "off-season" tropical cyclones have, however, slightly "brushed" the area at infrequent intervals. Those hurricanes and tropical storms which do severely affect Puerto Rico and the Virgin Islands develop over the waters of the southern North Atlantic to the east of the Lesser Antilles. The movements of the storms are usually towards the west and northwest.

The map below shows the paths of the more severe hurricanes which have passed directly over Puerto Rico since 1893.



Local Name	Dates	Fatalities	Damage	Maximum Wind in San Juan
1. San Rogue	August 16-17, 1893	4	-	-
2. San Ciriaco	August 8, 1899	3,000	\$20 million	75 m.p.h.
3. San Felipe	September 13, 1928	300	\$50 million	160 m.p.h.
4. San Nicholas	September 10-11, 1931	2	\$200 thousand	90 m.p.h.
5. San Ciprian	September 26-27, 1932	225	\$30 million	120 m.p.h.
6. Santa Clara (Betsy)	August 12, 1956	11	\$40 million	90 m.p.h.
7. Hugo	September 17-18, 1989	0	\$2 billion	77 m.p.h.
8. Marilyn (U.S.V.I.)	September 15-16, 1995	8	\$2.1 billion	129 m.p.h.
9. Hortense	September 09-10, 1996	3	-	62 m.p.h.
10. Lenny	November 16-18, 1999	0	\$105 million	39 m.p.h.

INTERNET ADDRESSES

- National Weather Service
<http://www.nws.noaa.gov>
- National Weather Service Southern Region Headquarters
<http://www.srh.noaa.gov>
- National Weather Service Puerto Rico - Virgin Islands Forecast Office
<http://www.srh.weather.gov/sju/>
- National Data Buoy Center
<http://seaboard.ndbc.noaa.gov>
- U.S. Coast Guard Navigation Center
<http://www.navcen.uscg.gov/marcomms>
- National Weather Service Marine Dissemination
<http://www.nws.noaa.gov/om/marine/home.htm>

NATIONAL WEATHER SERVICE RADIOFAX AND TEXT FORECASTS AVAILABLE VIA E-MAIL (FTPMAIL)

National Weather Service radiofax charts and text forecasts are available via E-mail. The FTPMAIL server is intended to allow Internet access for mariners and other users who do not have direct access to the World Wide Web but who are equipped with e-mail system. Turnaround is generally in under 1 hour, however, performance may vary widely and receipt cannot be guaranteed. To get started in using the NWS FTPMAIL service, follow these simple directions to the FTPMAIL "help" file (11 bytes)

Address: ftpmail@weather.noaa.gov
Subject: (not required)
Body: help

Direct any questions to 301-713-1677, extension 128, or 301-713-0882, extension 122.

OTHER MARINE WEATHER SERVICES CHARTS AVAILABLE

- MSC-1 Eastport, ME to Montauk Point, NY
- MSC-2 Montauk Point, NY to Manasquan, NJ
- MSC-3 Manasquan, NJ to Cape Hatteras, NC
- MSC-4 Cape Hatteras, NC to Savannah, GA
- MSC-5 Savannah, GA to Apalachicola, FL
- MSC-6 Apalachicola, FL to Morgan City, LA
- MSC-7 Morgan City, LA to Brownsville, TX
- MSC-8 Mexican Border to Point Conception, CA
- MSC-9 Point Conception, CA to Point St. George, CA
- MSC-10 Point St. George, CA to Canadian Border
- MSC-11/12 Great Lakes
- MSC-13 Hawaiian Waters
- MSC-14 Puerto Rico and Virgin Islands
- MSC-15 Alaskan Waters
- MSC-16 Guam and the Northern Mariana Islands

Copies of these charts are available for \$1.25 each from:

FAA/National Aeronautical Charting Office
Distribution Division, AVN-530
6303 Ivy Lane, Suite 400
Greenbelt, MD 20770

Telephone: 301-436-8301
800-638-8972 toll free, U.S. only
301-436-6829 FAX

Email: 9-AMC-chartsales@faa.gov
<http://chartmaker.ncd.noaa.gov>

or your local chart agent:
<http://chartmaker.ncd.noaa.gov/nsd/states.html>

Marine Service Charts can be viewed at:
<http://www.nws.noaa.gov/om/marine/pub.htm>

For nautical charts on the web for navigation purposes please go to:
<http://www.oceanservice.noaa.gov/pubs/welcome.html>
These nautical charts are also available from local marinas and marine supply stores.