DOMINICA

INTERNET WEATHER SERVICES

Dominica Meteorological Service www.weather.gov.dm	Marine synopsis and forecast for Dominica and the Lesser Antilles. Website also contains tidal information.

DOMINICA BROADCASTING SERVICES (DBS Radio)

Control Centre: 15°17′·98N 61°23′·18W

	88·1 MHz 89·5 MHz	FM	Eggleston	15°17′·73N 61°21′·81W
	103·5 MHz		Grand Bay	15°14′·20N 61°19′·20W
	103·1 MHz		Marigot	15°31′·46N 61°17′·44W
			Petite Soufriere	15°23′·78N 61°19′·20W
	104·1 MHz 104·7 MHz		Portsmouth	15°31′·57N 61°28′·16W

Weather Bulletins

Mon–Sat 0720 1030 LT	Forecast, synopsis, analysis and tide times for the waters of Dominica in English.

Navigational Warnings

Mon–Sat 0720 1030 LT	Navigational warnings for coastal waters of Dominica, including storm and hurricane warnings (during the season), in English.

ECUADOR

INTERNET WEATHER SERVICES

Ecuadorian Naval Institute of Oceanography www.inocar.mil.ec/web/index.php/boletines	Maritime weather forecasts for coastal waters up to 12 n miles offshore and Navigational Warnings.

NAVTEX

L	Ayora	518 kHz	0°43′·03S 90°19′·63W
A		490 kHz	

Diagrams pages 39 and 40

Navigational Warnings

L: 0150 0550 0950 1350 1750 2150	Navigational Warnings in English.
A: 0000 0400 0800 1200 1600 2000	Navigational Warnings in Spanish.

NOTE: Temporarily inoperative.

GUAYAQUIL (HCG)

Control Centre: 2°11′·50S 79°53′·93W

	Ch 26	VHF		

Navigational Warnings

0100 1300 On request	Navigational Warnings.

RADIO NAVAL

Control Centre: 2°11′·00S 79°54′·00W

	1510 kHz	AM		

Weather Bulletins

1200 LT	SHIP / SYNOP.

Navigational Warnings

0700 0800 1230 1800 LT	Navigational Warnings.

EL SALVADOR

INTERNET WEATHER SERVICES

El Salvador Department of the Environment www.snet.gob.sv/ver/meteorologia/pronostico/maritimo/	Maritime weather synopsis and forecast, in Spanish.

FALKLAND ISLANDS (UK)

FALKLAND ISLANDS RESCUE COORDINATION CENTRE & FISHERIES DEPARTMENT (FIRCC, FIFD)

Control Centre: 51°41′·89S 57°50′·38W

	4066·1	RT (HF)		51°41′·89S 57°50′·38W
Weather Bulletins				
0830 LT	Weather forecast for Falkland Islands open waters, in English and Spanish whenever possible.			
Navigational Warnings				
0830 LT	Local Navigational Warnings, in English and Spanish whenever possible.			

FALKLANDS RADIO

Control Centre: 51°41′·57S 57°51′·64W

	530 kHz	AM	Stanley	51°41′·88S 57°50′·45W
Weather Bulletins				
0710 0810 0910 1010 1610 1710 1815 2030 LT[1] 0910 1010 1815 2030 LT[2] 1815 2030 LT[3]	Shipping Forecast for the Falkland Islands Conservation Zone (FICZ) open waters, in English.			

[1] Mon–Fri
[2] Sat
[3] Sun

FIJI

INTERNET WEATHER SERVICES

Fiji Meteorological Service (FMS) www.met.gov.fj	Marine weather forecast in English.

MARITIME SAFETY INFORMATION (MSI) ON THE INTERNET

The internet is not part of the Maritime Safety Information system and should never be relied upon as the only means to obtain the latest forecast and warning information. Access to the service may be interrupted or delayed from time to time, updates may also be delayed. Please refer to GMDSS services, INMARSAT SafetyNET or international NAVTEX for the latest information. However, the following website(s) may prove useful to the mariner:

www.msaf.com.fj/pages4.php?ID=Maritime Safety Information	Maritime Safety Authority of Fiji	Coastal Navigational Warnings, local Marine Notices and related safety information, in English.

TROPICAL CYCLONE ALERTS AND WARNINGS

ACTIVATION OF NADI TCWC

1 Whenever there is a cyclone threat to Fiji, the Nadi Tropical Cyclone Warning Centre (Nadi TCWC) will be activated. It will start issuing Special Weather Bulletins containing TROPICAL CYCLONE ALERTS or TROPICAL CYCLONE WARNINGS as appropriate.

2 The Nadi TCWC is operated within the Weather Forecasting Division of the Fiji Meteorological Service (FMS) and can be accessed 24 hours a day as follows:

Telephone Switchboard: +679 6724888
Telephone Direct: +679 6736005, 6736006 & 6736007
(Calls must be kept short)
Fax: +679 6720190
Weather Fax: +679 6721227 or +679 6721229 (Polling fax)
FMS Website: www.met.gov.fj
E-mail: fms@met.gov.fj (general) or weather@met.gov.fj (weather and forecasts/warnings)

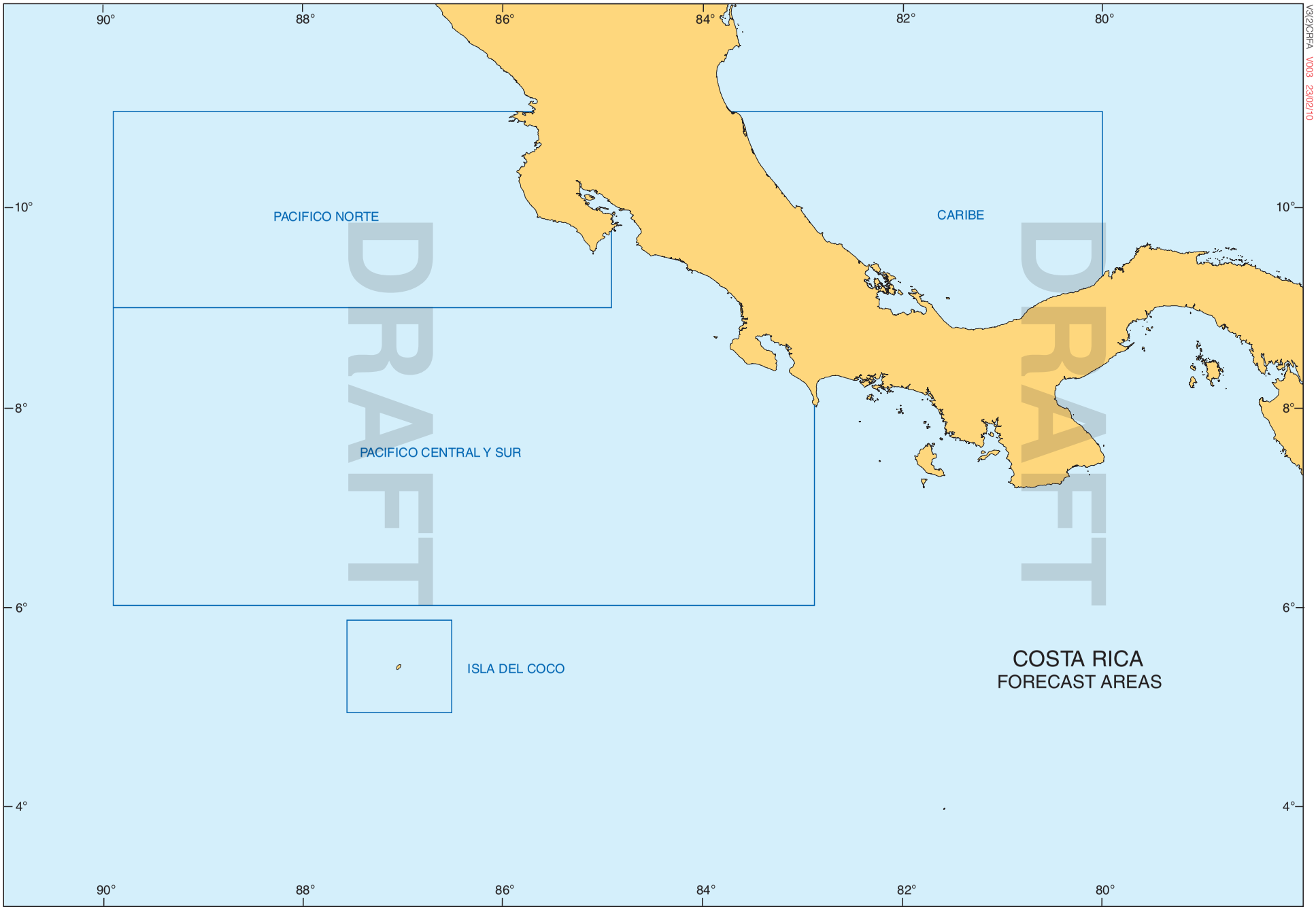
SPECIAL WEATHER BULLETINS

1 All Tropical Cyclone "Alerts" or "Warnings" for Fiji will be contained in SPECIAL WEATHER BULLETINS (SWBs) as opposed to Regular Weather Bulletins issued all the year round.

2 **SWB Numbering and Heading:** All SWBs will be numbered sequentially starting from BULLETIN NUMBER **ONE**.

3 Where a system is already a Tropical Cyclone, its name shall be included in the heading of the SWB, e.g. "SPECIAL WEATHER BULLETIN NUMBER ONE **ON TROPICAL CYCLONE 'KINI'** ISSUED FROM NADI AT . . . ."

Continued on page 157


90°
88°
86°
84°
82°
80°
10°
8°
6°
4°
PACIFICO NORTE
CARIBE
PACIFICO CENTRAL Y SUR
ISLA DEL COCO
COSTA RICA
FORECAST AREAS
DRAFT
V3(2)CRFA V003 23/02/10

FIJI

Tropical Cyclone Alerts and Warnings (Continued)

4 Where a system is still a Tropical Depression (i.e. yet to develop into a tropical cyclone) it shall be sufficient to refer to the bulletin type and number only, e.g. "SPECIAL WEATHER BULLETIN NUMBER ONE ISSUED FROM NADI AT . . . ." However, the procedure in 2.3 is to be adopted as soon as the system is named as a tropical cyclone. The numbering sequence shall be maintained all the time.

5 SWBs containing Tropical Cyclone "Alerts" or "Warnings" shall be headed "TROPICAL CYCLONE ALERT" or "TROPICAL CYCLONE WARNING" as appropriate. Where a SWB contains warnings for some areas and an alert for other areas, the warning header shall take precedence.

6 **Tropical Cyclone Alert Bulletins:** A SWB containing a TROPICAL CYCLONE ALERT will give progress information on the development of an incipient cyclone or the progress of a cyclone still some distance away, if there is a significant probability that winds over one or more parts of Fiji may later reach gale force or stronger. Alerts will be started, where possible, about **48 hours before** the likely onset of gales or stronger winds and will be maintained until such time as specific warnings become necessary, or the threat to Fiji recedes.

7 Bulletins containing TROPICAL CYCLONE ALERTS will be issued at least every six hours, preferably at regular bulletin times.

8 **Tropical Cyclone Warning Bulletins:** A SWB containing a TROPICAL CYCLONE WARNING will give GALE, STORM or HURRICANE Warning for specified areas according to the maximum average wind force expected. It will be issued when there is an expected occurrence of gales or stronger winds within 24 hours. Apart from average wind speeds, expected winds in momentary gusts will also be given.

9 Full SWBs headed as TROPICAL CYCLONE WARNING will normally be issued **every three hours**.

10 If information becomes available which points to a substantial change in the situation, thus invalidating the current warning, a SWB will be issued as soon as possible to inform users of the sudden change in the situation. Such an intermediate SWB will be brief and contain essential information including, for example, new areas threatened or changed movement of the cyclone. The numbering sequence for SWBs will be retained. All intermediate bulletins will be identified for emphasis by the prefix "FLASH".

11 **Tropical Cyclones threatening Rotuma:** The above mentioned procedures will also apply to Rotuma. When a Tropical Cyclone is anticipated to affect Rotuma only, and not any other part of Fiji, SWBs will only be issued for Rotuma and the forecast for Fiji continued in regular weather bulletins. However if the system is likely to later threaten Fiji then the forecast for Fiji shall be provided in the same SWBs and the regular bulletin ceased. The numbering sequence of the SWB shall be retained when Alerts and Warnings are commenced for Fiji.

SPECIAL MARINE BULLETIN

1 There will be circumstances when gales or stronger winds from a tropical cyclone are already affecting or are expected to affect part(s) of the Fiji waters only, and not any land areas. Under these circumstances a **Special Marine Bulletin (SMB)** will be issued giving specific warning to the marine community. Routine weather bulletins for the general public will be continued. The nautical system of units shall be used with speeds given in KNOTS (Nautical miles per hour) and distances in Nautical Miles (NM).

2 SMBs will be issued at least every six hours, preferably at regular marine bulletin times.

3 SMBs (otherwise regular marine bulletins) will be maintained during the period when Fiji is placed under public Alert issued in SWBs. However, all marine bulletins shall be discontinued upon the issue of the first SWB containing any warning for the Fiji Group. From thereon essential information for mariners shall be included in the SWB.

4 In the event of a Tropical Cyclone threatening Rotuma, prompting the issue of an Alert or Warning for Rotuma and not any other part of Fiji, the routine marine weather bulletin or any marine warnings for part(s) of Fiji waters will be continued.

PROMULGATION OF ALERTS AND WARNINGS

1 The Nadi TCWC will disseminate all SWBs and SMBs directly to the local radio stations for immediate broadcast to the public and marine community. SMBs will also be available on Suva Radio (3DP). The Wellington TCWC will provide backup services to the Nadi TCWC under an existing contingency plan.

2 Fiji Broadcasting Corporation Ltd (FBCL) will broadcast all ALERTS and WARNINGS (including marine warnings when these are in force) on receipt and at regular intervals thereafter. FBCL will continue to broadcast any routine weather bulletins for parts of Fiji for which a SWB is not in force, e.g. when an alert or warning is in force for Rotuma only.

3 COMMUNICATIONS FIJI LIMITED (CFL) will also broadcast all SWBs upon receipt and at regular intervals thereafter.

4 Information on any cyclone threat including specific ALERTS and WARNINGS issued for Fiji will be available to other radio stations and local television stations as well.

5 **SUVA RADIO (3DP)** will broadcast all marine bulletins including marine warnings contained in SMBs. It will also broadcast all SWBs containing GALE, STORM or HURRICANE WARNINGS on receipt as well as at scheduled weather broadcast times. (It will not broadcast SWBs designated as TROPICAL CYCLONE ALERTS, which are meant for land areas). It will also repeat ALL WARNINGS at the end of the first silence period after receipt and at 3 minutes past each hour.

6 **RECORDED BULLETINS** can also be listened to by dialling the following numbers:
+679 6736080– for all SWBs and regular weather bulletins for public (operated by Fiji Met)
+679 6736081– for all SMBs and regular marine bulletins (operated by Fiji Met)
+679 3301642– for all regular and special weather bulletins (operated by Telecom).

7 The latest SWB for Fiji (and other countries served by RSMC Nadi-TCC) can be accessed from the **FMS Weather Fax No +679 6721227 or +679 6721229** (polling fax). It will also be available on the FMS Website: www.met.gov.fj along with other information on the tropical cyclone(s) including track map(s).

COMMUNICATIONS FIJI LTD				
Legend FM (English)				
A	107·2 MHz	FM	Ba	
	106·4 MHz		Labasa	
			Lautoka	
	106·8 MHz		Levuka	
			Nausori	

Continued overleaf

FIJI

COMMUNICATIONS FIJI LTD (Continued)

A	106·8 MHz	FM	Navua	
	106·4 MHz		Rakiraki	
	107·2 MHz		Savusavu	
			Sigatoka	
	106·8 MHz		Suva	
Radio Sargam (Hindi)				
B	105·8 MHz	FM	Ba	
	104·2 MHz		Labasa	
			Lautoka	
	104·6 MHz		Levuka	
	105·6 MHz			
	104·6 MHz		Nausori	
			Navua	
	104·2 MHz		Rakiraki	
	105·8 MHz		Savusavu	
	105·6 MHz		Sigatoka	
	104·6 MHz		Suva	
Viti FM (Fijian)				
C	103·8 MHz	FM	Ba	
	99·6 MHz		Labasa	
			Lautoka	
	102·8 MHz		Levuka	
			Nausori	
	99·6 MHz		Navua	
	103·8 MHz		Rakiraki	
			Savusavu	
	102·8 MHz		Sigatoka	
	103·8 MHz		Suva	
			Tavua	

Weather Bulletins

A-C: On receipt Repeated as necessary	Cyclone and storm warnings including the possible development of cyclones, for the waters around Fiji. Normal broadcasts in English on A, Hindi on B and Fijian on C. During a cyclone alert for Fiji continuous broadcasts from all stations until the alert passes.
A: Mon–Fri: Every H+00 (0600–1900) Sat–Sun: 0800 0900 1000 1200 1300 1700 1800 **B:** Mon–Fri: Every H+00 (0500–1900) Sat: 0600 0700 0800 1000 1200 1300 1500 1700 1830 Sun: 0600 0700 1000 1200 1300 1500 1700 1830 **C:** Mon–Fri: Every H+00 (0600–1800) Sat: 0600 0700 0800 1200 1300 1700 Sun: 0600 0700 0800 1200 1700	Weather forecast including wind strength, sea swell and possible storm / cyclone warnings (if in force) for coastal waters of Fiji. Broadcasts in English on A, Hindi on B and Fijian on C.

NOTE(S): 1. Weather bulletins are broadcast after the news.
2. All times quoted are LT

FIJI BROADCASTING CORPORATION LTD (FBCL)				
Radio Fiji 1 (Fijian)				
A	1152 kHz	AM	Ba	
	558 kHz		Kadavu	
	684 kHz		Labasa	
	558 kHz		Lau	
	639 kHz		Lautoka	
	684 kHz		Levuka	
	639 kHz		Nadi	
	558 kHz		Nausori	
	1152 kHz		Rakiraki	
	684 kHz		Savusavu	
	927 kHz		Sigatoka	
	558 kHz		Suva	
			Tailevu	
	684 kHz		Taveuni	
	1152 kHz		Tavua	
	92·2 MHz	FM	Ba	
			Bua	
			Nabouwalu	
	107·6 MHz		Nausori	
			Navua	
	92·2 MHz		Rakiraki	
	107·6 MHz		Suva	
			Tailevu	
	92·2 MHz		Tavua	
Radio Fiji 2 (Hindi)				
B	1467 kHz	AM	Ba	
	774 kHz		Kadavu	
			Lau	
			Nausori	
	1467 kHz		Rakiraki	
	774 kHz		Suva	
			Tailevu	
			Taveuni	
	1467 kHz		Tavua	
	810 kHz		Vanua Levu	
	105 MHz	FM	Ba	
			Labasa	
	105·4 MHz		Lautoka	
	105 MHz		Levuka	
	105·4 MHz		Nadi	
	105·2 MHz		Nausori	
			Navua	
	89·8 MHz		Rakiraki	
	105 MHz		Savusavu	
			Sigatoka	
B	105·2 MHz	FM	Suva	
			Tailevu	

Continued overleaf

FIJI

FIJI BROADCASTING CORPORATION LTD (FBCL) (Continued)

Gold FM (English)				
C	94·6 MHz	FM	Ba	
	100·4 MHz		Kadavu	
	100 MHz		Labasa	
			Lautoka	
			Levuka	
			Nadi	
	100·4 MHz		Nausori	
	94·6 MHz		Rakiraki	
	100 MHz		Savusavu	
	100·6 MHz		Sigatoka	
	100·4 MHz		Suva	
			Tailevu	
	100·6 MHz		Taveuni	
	94·6 MHz		Tavua	

Weather Bulletins	
A-C: On receipt Repeated as necessary	Cyclone and storm warnings including the possible development of cyclones, for the waters around Fiji. Normal broadcasts in Fijian on A, Hindi on B and English on C. During a cyclone alert for Fiji continuous broadcasts from all stations in English until the alert passes.
A: Mon–Fri: Every H+00 (0600–1800) Sat–Sun: 0700 0800 1000 1200 1300 1700 LT **B:** Mon–Fri: Every H+00 (0600–2000) Sat–Sun: 0700 0800 1000 1200 1300 1500 1700 2000 LT **C:** Mon–Fri: Every H+00 (0600–1800) Sat–Sun: 0800 1300 1700 LT	Weather forecast, including wind strength, sea swell and possible storm / cyclone warnings (if in force), for coastal waters of Fiji and surrounding islands. Broadcasts in Fijian on A, Hindi on B and English on C.
NOTE(S): Weather bulletins are broadcast after the news.	

SUVA (3DP)

Control Centre: 18°06′·98S 178°26′·39E

	4372 *(Ch 406)* 8746 *(Ch 810)*	RT (HF)		

Weather Bulletins	
0803 1203 1603 2003 LT	Forecast for coastal waters of Fiji.

Navigational Warnings	
On receipt then every H+03	Cyclone and storm warnings for coastal waters of Fiji.
0803 1203 1603 2003 LT	Navigational Warnings.

FRENCH ANTILLES

GENERAL NOTES

INTERNET

Meteorological information: see Internet Weather Services entry or e-mail: guyane@meteo.fr

TELEPHONE

A voice mailbox, accessible only from the Caribbean, issues the following meteorological information (chargeable):
Bulletin “large” for the North Atlantic south of 40°N, 24h forecast for the area 10°N–20°N, 57°W–65°W and outlook for the following day.
Coastal meteorological bulletin for:

Martinique, St. Lucia, Dominica
Saint Martin, Saint Barthélémy
Guadeloupe and neighbouring islands.

Continued on next page

FRENCH ANTILLES

General Notes (Continued)

Each bulletin contains: storm warnings, outlook, 24h forecast and outlook for the area extending 25 miles offshore. To call the voicemail from a landline telephone: +596 0892 680808.

INTERNET WEATHER SERVICES	
Meteo France Antilles-Guyane http://www.meteofrance.gp/previsions-meteo-marine-antilles-guyane/cotes	Includes marine weather forecasts, weather charts, wind predictions and BMS for French Guiana and the French Antilles.

MARITIME SAFETY INFORMATION (MSI) ON THE INTERNET		
The internet is not part of the Maritime Safety Information system and should never be relied upon as the only means to obtain the latest forecast and warning information. Access to the service may be interrupted or delayed from time to time, updates may also be delayed. Please refer to GMDSS services, INMARSAT SafetyNET or international NAVTEX for the latest information. However, the following website(s) may prove useful to the mariner:		
http://infonautantilles.weebly.com/	French Ministry of Defence	Navigational Warnings for Martinique, Guadeloupe and St. Martin/St. Barthélémy, in French.

FIRING PRACTICE AREA

A small arms firing practice area exists NW of the port of Basse-Terre, approximately between Pte des Pères (16°01'N 61°45'W), Pte du Corps de Garde (16°03'N 61°46'W) and extends 3·5 n miles from the shore. Gunfire warnings are broadcast when the area is in use. For broadcast details refer to MARTINIQUE: CROSS Antilles-Guyane – MRCC Fort de France.

RADIO FRANCE OUTREMER GUADELOUPE				
	640 kHz	AM		
	88·9 MHz 92·3 MHz 96·8 MHz 97 MHz 97·4 MHz	FM		
Weather Bulletins				
On receipt	During the cyclone period, information bulletins providing information on the phenomenon from the tropical depression stage will be broadcast at least every 6 hours during the pre-alert periods and every 3 hours during the alert periods. Meteo-flash bulletins are broadcast providing information on dangerous weather such as strong cyclonic swells, irrespective of whether there is a period of alert or pre-alert.			

RADIO FRANCE OUTREMER MARTINIQUE				
	1310 kHz	AM		
	92 MHz 93·2 MHz 94 MHz 94·3 MHz 94·5 MHz	FM		
Weather Bulletins				
1903	Storm warnings, 24 hour forecast and general situation for the Lesser Antilles in French.			
NOTE(S):	During the cyclone period, information bulletins providing information on the phenomenon from the tropical depression stage, will be broadcast at least every 6 hours during the pre-alert periods and every 3 hours during the alert periods. Meteo-flash bulletins are broadcast providing information on dangerous weather such as strong cyclonic swells irrespective of whether there is a period of alert or pre-alert.			

FRENCH GUIANA

GENERAL NOTES

INTERNET

Meteorological information: see Internet Weather Services entry or e-mail: guyane@meteo.fr

TELEPHONE

A recorded weather bulletin, issued by Météo France, is available which covers coastal areas up to 25 n miles off-shore by calling +594 378300. The bulletin includes a 24hr forecast and outlook, as well as tide times for the Salvation Islands.

INTERNET WEATHER SERVICES	
Meteo France Antilles-Guyane www.meteofrance.gp/previsions-meteo-marine-antilles-guyane/cotes	Includes marine weather forecasts, weather charts, wind predictions and BMS for French Guiana and the French Antilles.

FRENCH GUIANA

MARITIME SAFETY INFORMATION (MSI) ON THE INTERNET

The internet is not part of the Maritime Safety Information system and should never be relied upon as the only means to obtain the latest forecast and warning information. Access to the service may be interrupted or delayed from time to time, updates may also be delayed. Please refer to GMDSS services, INMARSAT SafetyNET or international NAVTEX for the latest information. However, the following website(s) may prove useful to the mariner:

www.guyane.pref.gouv.fr/Politiques-publiques/Securite/Securite-nautique	Préfet Maritime	Navigation Warnings and other related information in French.

RADIO FRANCE INTERNATIONALE

Control Centre: 4°54′·00N 52°30′·00W

	13640 kHz	AM	North America	
	15365 kHz 17800 kHz		Central America & Caribbean	

Diagram page 163

Weather Bulletins

1130	Storm warnings, synopsis, development and 24 hour forecast in French.

NOTE(S): Central America & Caribbean broadcasts operational July–Sept.

FRENCH POLYNESIA

GENERAL NOTES

TELEPHONE

Two numbers are available for meteorological information.

+689 404 42708: To listen to forecasts for each archipelago, followed by weather bulletins for the sea areas around French Polynesia.

+689 404 42709: To receive a fax of the forecasts by archipelago, weather bulletins, charts and prognosis of the sea states for the next 24, 48 and 60 hours.

INTERNET WEATHER SERVICES

Météo France Polynesia www.meteo.pf	Maritime weather forecast in French.

MARITIME SAFETY INFORMATION (MSI) ON THE INTERNET

The internet is not part of the Maritime Safety Information system and should never be relied upon as the only means to obtain the latest forecast and warning information. Access to the service may be interrupted or delayed from time to time, updates may also be delayed. Please refer to GMDSS services, INMARSAT SafetyNET or international NAVTEX for the latest information. However, the following website(s) may prove useful to the mariner:

www.jrcc.pf/infonaut	JRCC Tahiti website	Navigation Warnings in French.

JRCC TAHITI

Control Centre: 17°31′·70S 149°33′·02W

A[1]	8803	RT (HF)		
B[2]	Ch 13	VHF		

Diagram page 164

Weather Bulletins

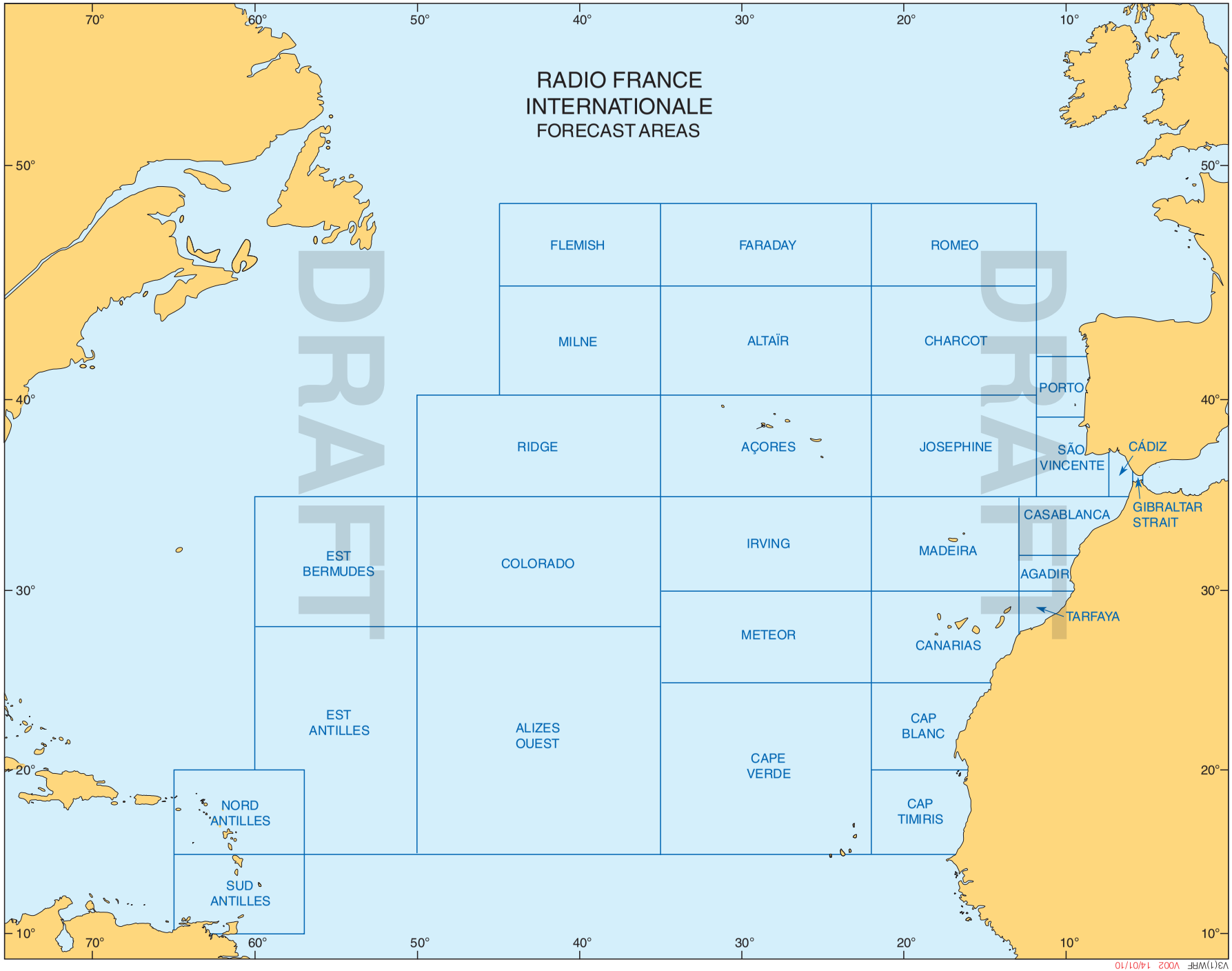
A: 0730 1630 LT **B:** 0630 1200 1600 2000 LT	Weather bulletins in French.

Navigational Warnings

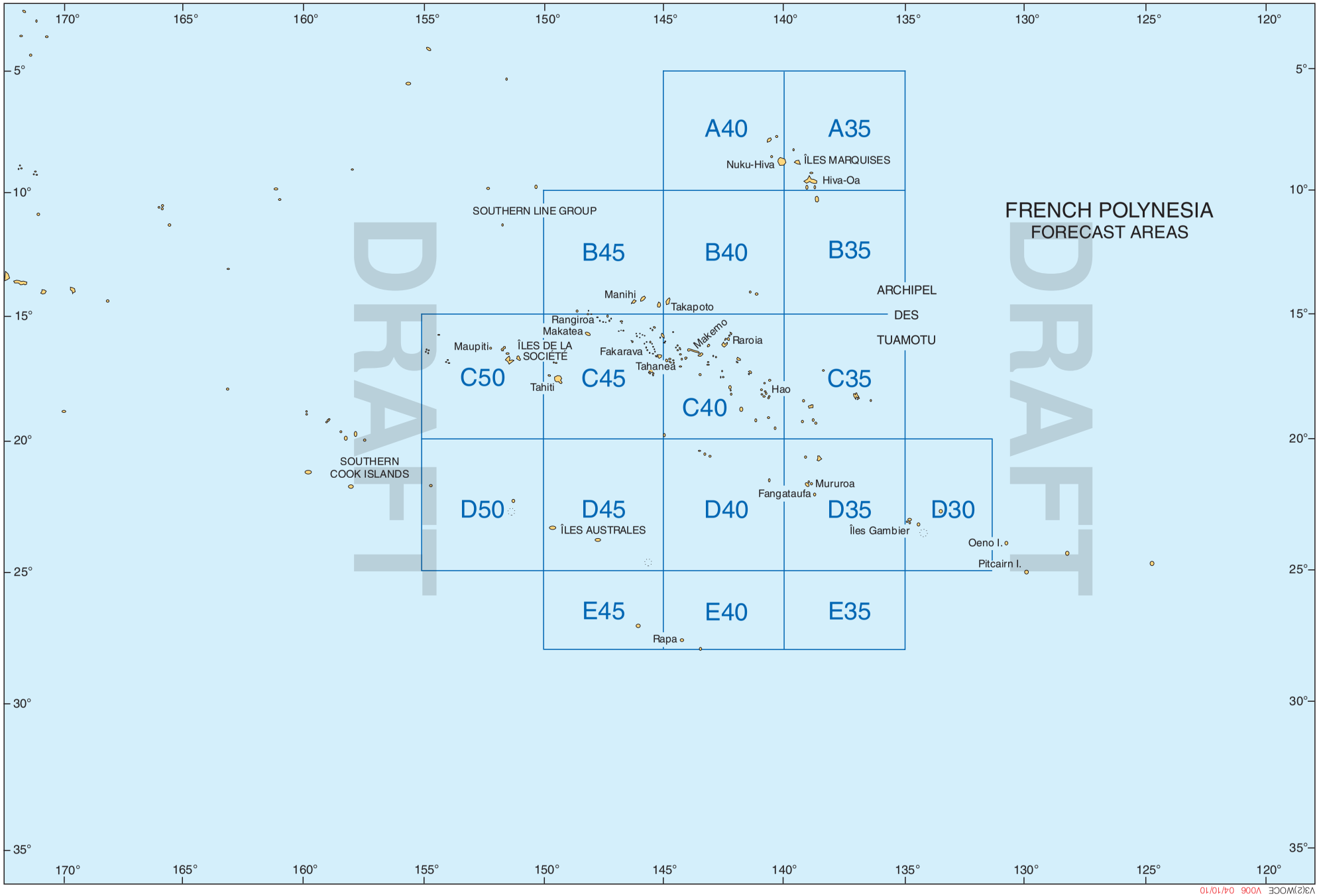
A: On receipt 0730 1230 1630 2030 LT **B:** On receipt 0630 1200 1600 2000 LT	BMS in French.
A: 0730 1630 LT	Local AVURNAVs in French.

[1] After prior announcement on 8291 kHz.

[2] After prior announcement on VHF Ch 16.



V3(1)WRF V002 14/01/10



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FRENCH POLYNESIA

POLYNÉSIE PREMIERE (1ÈRE)				
Control Centre: 17°30′·01S 149°29′·05W				
A	738 kHz	AM		
Îles du Vent (Society Islands – East)				
B	89 MHz	FM	Moorea (Maatea)	17°35′·07S 149°48′·44W
	89·6 MHz		Moorea (Papeotai)	17°29′·87S 149°52′·36W
	95·2 MHz		Tahiti (Mahaena)	17°34′·29S 149°19′·02W
	99 MHz		Tahiti (Mahina)	17°30′·01S 149°29′·05W
	91·8 MHz		Tahiti (Mont Marau)	17°36′·47S 149°32′·17W
	95·2 MHz		Tahiti (Papara)	17°45′·50S 149°29′·50W
	89 MHz		Tahiti (Papeete)	17°33′·69S 149°33′·88W
	89·6 MHz		Tahiti (Puna'auia)	17°38′·14S 149°36′·46W
	99 MHz		Tahiti (Taravao)	17°43′·50S 149°18′·50W
	90·5 MHz		Tahiti (Tiarei)	17°32′·50S 149°21′·00W
Îles sous le Vent (Society Islands – West)				
C	96·6 MHz	FM	Bora Bora (Vaitape)	16°30′·50S 151°45′·00W
	94 MHz		Raiatea (Uturoa)	16°43′·74S 151°26′·73W
Tuamotu Islands				
D	94·8 MHz	FM	Anaa (Tukuhora)	17°20′·53S 145°30′·41W
	95·2 MHz		Apataki (Niutahi)	15°34′·30S 146°24′·74W
	90·5 MHz		Arutua (Rautini)	15°21′·66S 146°37′·21W
	94 MHz		Faaite (Hitianau)	16°41′·22S 145°19′·96W
	94·4 MHz		Fakahina (Tarione)	15°59′·49S 140°09′·88W
			Fakarava (Rotoava)	16°03′·27S 145°37′·16W
	94·8 MHz		Fangatau (Teana)	15°49′·66S 140°53′·49W
	94·4 MHz		Hao (Otepa)	18°05′·96S 140°54′·67W
	93·6 MHz		Kaukura (Raitahiti)	15°40′·28S 146°52′·74W
	94 MHz		Makemo (Pouheva)	16°37′·37S 143°34′·14W
	94·4 MHz		Manihi (Turipaoa)	14°24′·91S 146°02′·49W
	93·6 MHz		Mataiva (Pahua)	14°52′·21S 148°42′·80W
			Napuka (Tepukamaruia)	14°09′·90S 141°16′·24W
	94 MHz		Nukutavake (Tavana)	19°16′·71S 138°46′·25W
	95·2 MHz		Pukarua (Marautangaroa)	18°16′·05S 137°03′·93W
	94 MHz		Rangiroa (Airport)	14°57′·37S 147°39′·71W
	94·4 MHz		Reao (Rapuarava)	18°27′·85S 136°26′·63W
	94·8 MHz		Takapoto (Fakatopatere)	14°39′·10S 145°14′·47W
	93·6 MHz		Takaroa (Teavarao)	14°28′·03S 145°02′·30W
	94·8 MHz		Tatakoto (Tumukuru)	17°21′·02S 138°27′·17W
			Tikehau (Tuherahera)	15°07′·42S 148°14′·06W
			Tureia (Fakamaru)	20°46′·30S 138°33′·86W
Marquises (Marquesas) Islands				
E	88·2 MHz	FM	Hiva Oa (Atuona)	9°48′·22S 139°02′·44W
	89·5 MHz		Hiva Oa (Tapeata)	9°46′·29S 138°57′·95W
	89 MHz		Nuku Hiva (Mont Muake)	8°52′·97S 140°06′·12W
	90·5 MHz		Nuku Hiva (Taiohae)	8°54′·39S 140°06′·52W
	91 MHz		Ua Huka (Vaipaee)	8°55′·55S 139°34′·77W
	91·5 MHz		Ua Pou (Hakahau)	9°22′·00S 140°03′·00W
Gambier Islands				
F	94·4 MHz	FM	Rikitea	23°07′·16S 134°58′·21W

Continued overleaf

FRENCH POLYNESIA

POLYNÉSIE PREMIERE (1ÈRE) (Continued)

Îles Australes (Austral Islands)				
G	89·6 MHz	FM	Raivavae (Rairua)	23°52′·27S 147°41′·39W
	99·4 MHz		Rapa (Ahurei)	27°37′·17S 144°20′·09W
			Rimatara (Amaru)	22°38′·84S 152°47′·61W
	89·6 MHz		Rurutu (Moerai)	22°27′·50S 151°21′·00W
	99·4 MHz		Tubuai (Mataura)	23°20′·87S 149°29′·12W
Diagram page 164				
Weather Bulletins				
A-G: 0510 1822 LT[1] 1920 LT[2]	Forecast for the archipelago for fishing vessels and pleasure craft in the triangle Tahiti–Maupiti–Manihi in French and Tahitian.			

[1] Mon–Fri.
[2] Sat and Sun.

GALAPAGOS ISLANDS (Ecuador)

AYORA (ISLA SANTA CRUZ) (HCY) [4757]

Control Centre: 0°44′·80S 90°19′·00W

	Ch 26	VHF		
Navigational Warnings				
1350	Navigational Warnings.			

GREENLAND

INTERNET WEATHER SERVICES

Danmarks Meteorologisk Institut www.dmi.dk/en/groenland/hav/sea-areas-forecast	Marine weather forecast for Greenland Sea Areas and links to associated information such as: wind data, tidal information, weather and ice charts, in English and Danish.

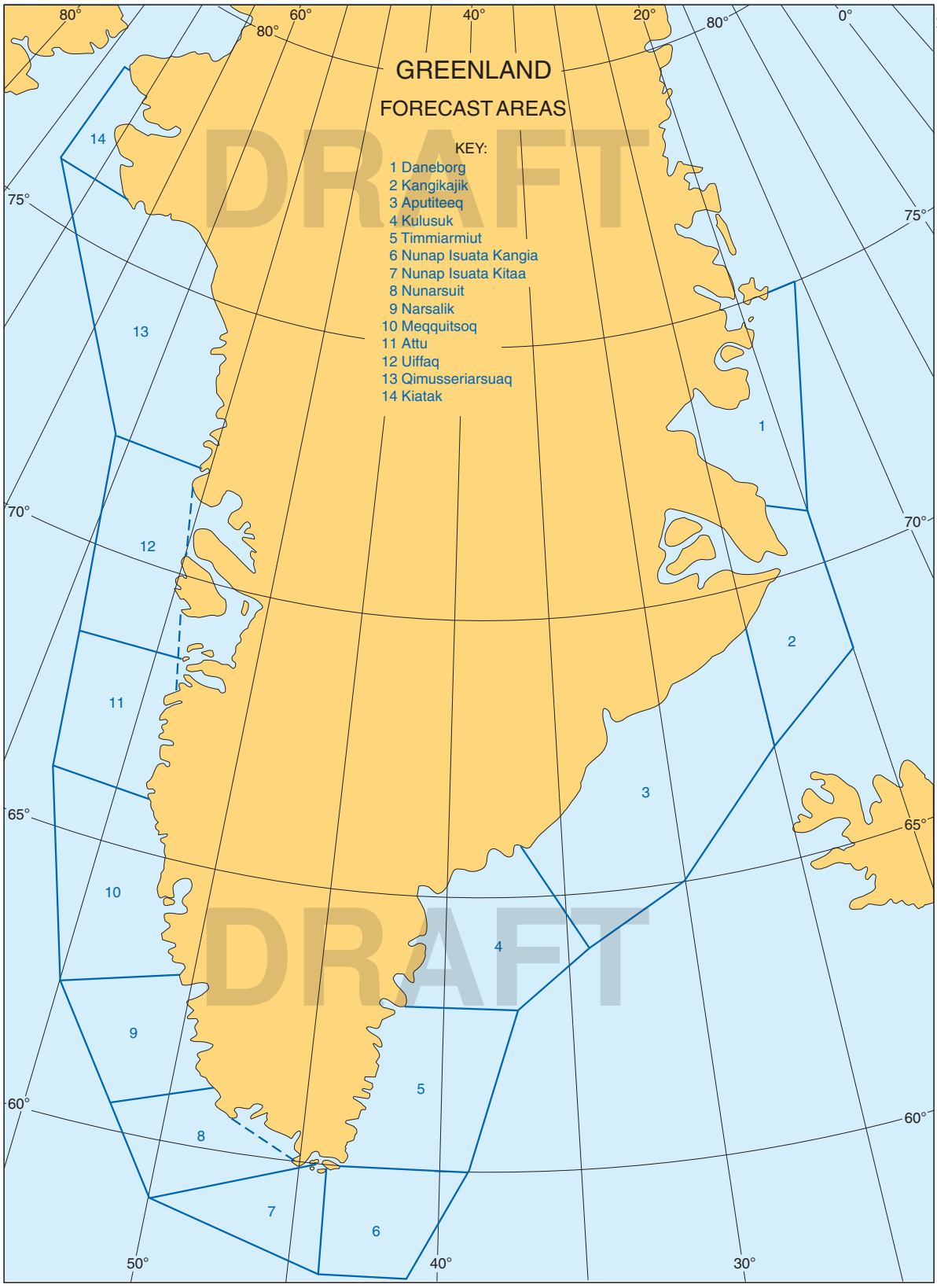
NAVTEX

X	Grindavik (Iceland)	518 kHz	63°49′·99N 22°27′·04W
W	Kook Island (Nuuk)		64°04′·12N 52°00′·51W
R	Saudanes (Iceland)		66°11′·17N 18°57′·12W
M	Simiutaq		60°41′·20N 46°35′·00W
I	Upernavik		72°46′·98N 56°08′·33W

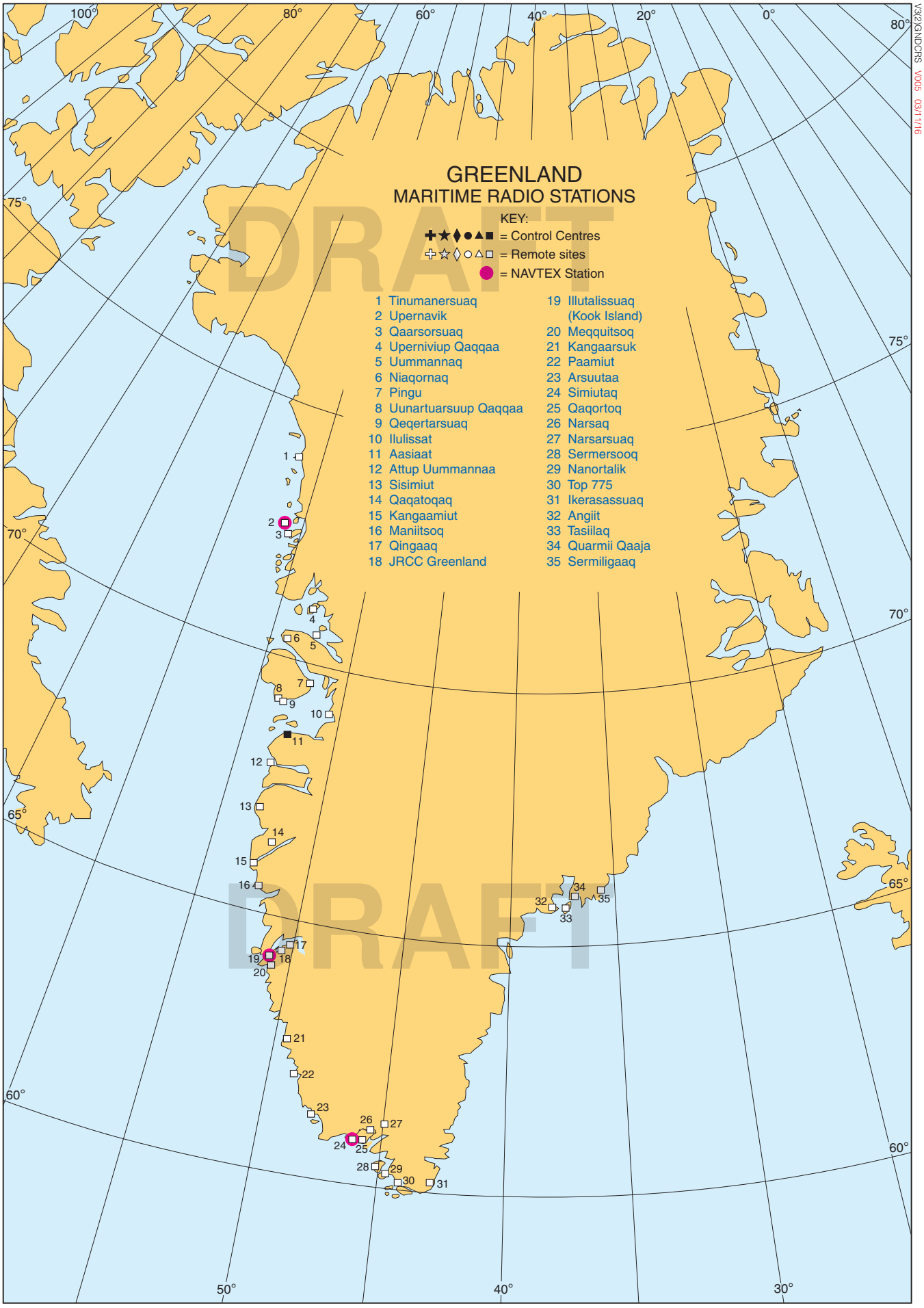
Diagrams pages 42, 43, 167 and 168

Weather Bulletins	
X: 0350 0750 1150 1550 1950 2350	Weather forecast for Areas 3–5.
W: 0340 0740 1140 1540 1940 2340	Weather forecast for Areas 9–11.
R: 0250 0650 1050 1450 1850 2250	Weather forecast for Areas 1–3.
M: 0200 0600 1000 1400 1800 2200	Weather forecast for Areas 5–8.
I: 0120 0520 0920 1320 1720 2120	Weather forecast for Areas 12–14.
Navigational Warnings	
X: 0350 0750 1150 1550 1950 2350	Storm and Navigational Warnings and ice reports.
W: 0340 0740 1140 1540 1940 2340	
R: 0250 0650 1050 1450 1850 2250	
M: 0200 0600 1000 1400 1800 2200	
I: 0120 0520 0920 1320 1720 2120	

NOTE: Weather and Navigational Warnings for the east coast of Greenland are broadcast by Iceland where necessary - see relevant entry.



V3(2)WGND V002 17/07/12



V3/2/GNDCRS V005 03/11/16

GREENLAND

MARITIME SAFETY INFORMATION (MSI) ON THE INTERNET		
The internet is not part of the Maritime Safety Information system and should never be relied upon as the only means to obtain the latest forecast and warning information. Access to the service may be interrupted or delayed from time to time, updates may also be delayed. Please refer to GMDSS services, INMARSAT SafetyNET or international NAVTEX for the latest information. However, the following website(s) may prove useful to the mariner:		
www.dma.dk/ships/sider/greenlandwaters.aspx	Danish Maritime Authority	Links to MSI and other related information specific to navigation in Greenland waters, in English and Danish.
https://arcticweb.e-navigation.net		Web-based application which gives a single point of access to safety related information such as: Navigational Warnings, weather forecasts and ice charts, together with reporting facilities for GREENPOS and Coastal Control, for the Arctic waters around Greenland.

AASIAAT (OYR)

Control Centre: 68°42′·66N 52°51′·36W

A	2265	RT (MF)	Ikerasassuaq	60°03′·00N 43°09′·00W
	2116		Illutalissuaq (Kook Island)	64°04′·12N 52°00′·50W
	2400		Maniitsoq	65°25′·14N 52°54′·16W
	2225		Paamiut	61°59′·75N 49°39′·00W
	2304		Qeqertarsuaq	69°14′·67N 53°31′·60W
	2129		Simiutaq	60°41′·20N 46°36′·00W
	3125		Sisimiut	66°56′·03N 53°41′·90W
	2250		Tasiilaq	65°36′·56N 37°38′·17W
	3276		Upernavik	72°46′·98N 56°08′·33W
	3280		Uummannaq	70°40′·99N 52°08′·10W
	6522 *(Ch 608)* 4381 *(Ch 409)*	RT (HF)	Aasiaat	68°42′·00N 52°50′·65W
B	Ch 27	VHF	Angiit	65°39′·00N 38°11′·00W
			Arsuutaa	61°08′·50N 48°22′·66W
	Ch 28		Attup Uummannaa	67°58′·00N 53°47′·00W
	Ch 01		Ikerasassuaq	60°03′·00N 43°09′·00W
	Ch 26		Illutalissuaq (Kook Island)	64°04′·12N 52°00′·50W
	Ch 25		Ilulissat	69°12′·65N 51°06′·30W
	Ch 24		Kangaamiut	65°49′·63N 53°20′·56W
	Ch 28		Kangaarsuk	62°58′·93N 50°31′·48W
	Ch 25		Maniitsoq	65°25′·14N 52°54′·16W
	Ch 04		Nanortalik	60°08′·45N 45°14′·55W
	Ch 24		Narsaq	60°53′·80N 46°01′·17W
	Ch 23		Narsarsuaq	61°09′·00N 45°26′·00W
	Ch 02		Niaqornaq	70°25′·00N 54°00′·00W
	Ch 23		Paamiut	61°59′·75N 49°39′·00W
	Ch 24		Pingu	69°46′·00N 52°02′·00W
	Ch 04		Qaarsorsuaq	72°42′·00N 56°05′·00W
	Ch 26		Qaqatoqaq	66°38′·00N 52°52′·00W
	Ch 02 25		Qaqortoq	60°43′·00N 46°01′·00W
	Ch 03		Qingaaq	64°23′·60N 51°06′·00W
	Ch 25		Quarmil Qaaja	65°44′·47N 37°02′·62W
	Ch 28		Sermersooq	60°13′·00N 45°22′·00W
	Ch 26		Sermiligaaq	65°54′·50N 36°22′·00W
			Simiutaq	60°41′·20N 46°36′·00W
	Ch 01		Sisimiut	66°56′·03N 53°41′·90W

Continued overleaf

GREENLAND

AASIAAT (OYR) (Continued)

B	Ch 60	VHF	Tinumanersuaq	74°06′·65N 57°12′·53W
	Ch 03		Top 775	60°00′·00N 44°34′·00W
	Ch 63		Upperniviup Qaqqaa	71°10′·00N 52°57′·00W
	Ch 03		Uummannaq	70°40′·99N 52°08′·10W
	Ch 23		Uunartuarsuup Qaqqaa	69°16′·50N 53°32′·00W
Diagrams pages 167 and 168				
Weather Bulletins				
A, B: On request	Weather forecast and outlook for the next 18 hours in English, Greenlandic and Danish.			
Navigational Warnings				
A, B: 0605 1105 1605 2105 LT	Storm and gale warnings in English, Greenlandic and Danish.			
A[1], B[1]: On receipt then 0035 0335 0635 0935 1235 1535 1835 2135	Navigational Warnings in English and Danish.			
A, B: On request	Ice reports in English, Greenlandic and Danish.			
[1] After Traffic Lists until cancelled				
NOTE(S): Scheduled warnings will be announced on 2182 kHz and Ch 16, other warnings will be announced on DSC, then 2182 kHz and Ch 16 then read on the working frequencies. Repeated after the silence period more than half an hour from the first transmission.				

KALAALLIT NUNAATA RADIO (KNR)

Control Centre: 64°11′·00N 51°43′·00W

	570 kHz	AM	Illutalissuaq (Kook Island)	64°04′·12N 52°00′·50W
	650 kHz		Qeqertarsuaq	69°14′·67N 53°31′·60W
	720 kHz		Simiutaq	60°41′·20N 46°35′·00W
	90·5-104 MHz	FM		
Diagrams pages 167 and 168				
Weather Bulletins				
0630 0845 1840 2145 LT	Weather forecast for the next 24 hours, including gale, storm and ice accretion warnings, in Greenlandic and Danish.			
Navigational Warnings				
1700 LT[1]	Local Navigation Warnings, in Greenlandic and Danish.			
[1] One broadcast is made at a variable point between 1700 and 1800 LT on all frequencies.				

GRENADA

INTERNET WEATHER SERVICES

Grenada Meteorological Service http://weather.mbiagrenada.com/	Marine weather prognosis and forecast for up to three days, covering coastal waters of Grenada, Carriacou and Petite Martinique, in English.

GRENADA COAST GUARD (SAINT GEORGE'S) MRCC

Control Centre: 12°08′·00N 61°41′·00W

	Ch 16 87	VHF		
Weather Bulletins				
On request H24	Weather forecast for coastal waters of Grenada and surrounding area.			

GUAM (USA)

NAVTEX

V	Guam	518 kHz	13°28′·71N 144°50′·26E
Diagram page 37			
Weather Bulletins			
V: 0330 0730 1130 1530 1930 2330	Weather forecast for Guam and N Mariana Islands.		

Continued on next page

GUAM (USA)

NAVTEX (Continued)

Navigational Warnings	
V: 0330 0730 1130 1530 1930 2330	Gale and Navigational Warnings for Guam and N Mariana Islands.
NOTE: Broadcasts are remotely controlled from COMMCOM.	

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

For complete details of the NOAA's operations and services, please see the note under the United States of America Geographic Area.

GUAM SECTOR (US COAST GUARD) (NRV)

Control Centre: 13°25′·78N 144°38′·97E

A	12579	RADIO-TELEX	Guam (HF aerial)	13°28′·47N 144°50′·19E
B	16806·5			
C	22376			
D	6501 *(Ch 601)*	RT (HF)		
E	13089 *(Ch 1205)*			
F	Ch 22A	VHF	Guam Sector	

Diagrams pages 265 and 266

Weather Bulletins	
A-C: 0500 1500 1900 2315	Weather forecast for N Pacific Ocean W of 180°.
F: 0900 2100	Weather forecast for Guam and N Mariana Islands.
D: 0930 1530 **E:** 0330 2130	Synopsis and forecast for the following areas: N Pacific Ocean — N of 30°N and E of a line from the Bering Strait to 50°N 160°E. NE Pacific Ocean — Equator to 30°N and E of 140°W. N Pacific Ocean — Equator to 30°N and 140°W to 160°E.

Navigational Warnings	
F: On receipt	Gale warnings for 0°–50°N, 110°E–180°.
A-C: 0500 1500 1900 2315	Gale warnings for N Pacific Ocean W of 180° and the Indian Ocean.
F: 0900 2100	Gale warnings for Guam and N Mariana Islands. Local Navigational Warnings.
D: 0930 1530 **E:** 0330 2130	Gale warnings for the following areas: N Pacific Ocean — N of 30°N and E of a line from the Bering Strait to 50°N 160°E. NE Pacific Ocean — Equator to 30°N and E of 140°W. N Pacific Ocean — Equator to 30°N and 140°W to 160°E. Tsunami Watch / Warning for Central Pacific, whilst in force. Maritime safety information.
A-C: 0230 0500 0900 1500 1900 2315	HYDROPACs Maritime safety information including NAVAREA XII warnings.
NOTE(S): RADIO-TELEX broadcasts are remotely controlled from COMMCOM.	

GUATEMALA

INTERNET WEATHER SERVICES

National Institute of Sismology, Vulcanology, Meteorology and Hydrology. http://www.insivumeh.gob.gt/hidrologia/oceanografia.html	Wave height, current and sea temperature data, together with meteorological and seismic warnings, in Spanish.

HONDURAS

INTERNET WEATHER SERVICES

Honduras Merchant Marine Directorate http://marinamercante.gob.hn	Marine weather, tidal and astronomical information, in English and Spanish.

INDONESIA

INTERNET WEATHER SERVICES

Indonesian Meteorology Climatology and Geophysics Council http://maritim.bmkg.go.id/prakiraan/weather_bulletin_for_shipping	Maritime weather bulletins, in English and Indonesian.

NAVTEX

B	Amboina (Ambon)	518 kHz	3°41′·68S 128°11′·88E
E	Jakarta		6°07′·15S 106°51′·78E
A	Jayapura		2°31′·13S 140°43′·30E
D	Ujungpandang (Makassar)		5°04′·89S 119°29′·83E

Diagram page 37

Weather Bulletins

B: 0010 0410 0810 1210 1610 2010 E: 0040 0440 0840 1240 1640 2040 A: 0000 0400 0800 1200 1600 2000 D: 0030 0430 0830 1230 1630 2030	24 hour forecast, synopsis and analysis for Indonesian waters and China Sea.

Navigational Warnings

B: 0010 0410 0810 1210 1610 2010 E: 0040 0440 0840 1240 1640 2040 A: 0000 0400 0800 1200 1600 2000 D: 0030 0430 0830 1230 1630 2030	Storm warnings and Navigational Warnings.

INDONESIA (Jawa)

JAKARTA (PKX) [2200]

Control Centre: 6°07′·47S 106°51′·27E

A	8542	WT (HF)		
B	12970·5			
C	2690	RT (MF)		

Diagram page 148

Weather Bulletins

A-C: 1100	Storm warnings, 24 hour forecast, synopsis and analysis for Indonesian waters and China Sea, also Indian and Pacific Oceans if applicable in English.

Navigational Warnings

A, B: 0200 1000 1800	Navigational and meteorological warnings in English.

JAMAICA

INTERNET WEATHER SERVICES

Meteorological Service Jamaica www.metservice.gov.jm	Marine weather forecast in English.

JAMAICA COAST GUARD (KINGSTON) MRCC (6YX)

Control Centre: 17°56′·08N 76°50′·68W

A	8291	RT (HF)		
B	Ch 13	VHF		

Weather Bulletins

A: 1330 1830 **B:** 0130 1430 1900	Weather synopsis for SW, NW and E Caribbean, and forecasts for coastal waters of Jamaica.

Navigational Warnings

A: H+00 **B:** H+30	Imminent hurricane and tropical storms which only affect Jamaica.
A, B: 1330 1830	Navigational Warnings.

JAPAN

INTERNET WEATHER SERVICES

Japanese Meteorological Agency www.jma.go.jp	Marine forecasts in English and Japanese.
Japanese Coast Guard https://www6.kaiho.mlit.go.jp/kisyou_en.html	Wind speed/direction observations, in Japanese and English.

NAVTEX

K	Kushiro	518 kHz	42°57′·35N 144°35′·37E
H	Moji		34°00′·90N 130°56′·10E
G	Naha		26°05′·47N 127°40′·12E
J	Otaru		43°19′·53N 140°26′·83E
I	Yokohama		35°14′·55N 139°55′·28E
K	Kushiro	424 kHz	42°57′·35N 144°35′·37E
H	Moji		34°00′·90N 130°56′·10E
G	Naha		26°05′·47N 127°40′·12E
J	Otaru		43°19′·53N 140°26′·83E
I	Yokohama		35°14′·55N 139°55′·28E

Diagrams pages 37, 38, 175 and 176

Weather Bulletins

K: 0140 0540 0940 1340 1740 2140	Weather synopsis, 12 and 24 hour forecast (only for typhoon) for Sea Areas 2, 4, 5 and 7–12 in English.
H: 0110 0510 0910 1310 1710 2110	Weather synopsis, 12 and 24 hour forecast (only for typhoon) for Sea Areas 13, 16–19, 25, 26, 28–30, 32 and 33 in English.
G: 0100 0500 0900 1300 1700 2100	Weather synopsis, 12 and 24 hour forecast (only for typhoon) for Sea Areas 26, 27 and 30–37 in English.
J: 0130 0530 0930 1330 1730 2130	Weather synopsis, 12 and 24 hour forecast (only for typhoon) for Sea Areas 1, 3, 4, 6, 7 and 13–16 in English.
I: 0120 0520 0920 1320 1720 2120	Weather synopsis, 12 and 24 hour forecast (only for typhoon) for Sea Areas 11, 12, 20–24, 26 and 27 in English.
K: 0108 0508 0908 1308 1708 2108	Weather synopsis, 12, 24 and 48 hour forecast for Sea Areas 2, 4, 5 and 7–12 in Japanese.
H: 0017 0417 0817 1217 1617 2017	Weather synopsis, 12, 24 and 48 hour forecast for Sea Areas 13, 16–19, 25, 26, 28–30, 32 and 33 in Japanese.
G: 0000 0400 0800 1200 1600 2000	Weather synopsis, 12, 24 and 48 hour forecast for Sea Areas 26, 27 and 30–37 in Japanese.
J: 0051 0451 0851 1251 1651 2051	Weather synopsis, 12, 24 and 48 hour forecast for Sea Areas 1, 3, 4, 6, 7 and 13–16 in Japanese.
I: 0034 0434 0834 1234 1634 2034	Weather synopsis, 12, 24 and 48 hour forecast for Sea Areas 11, 12, 20–24, 26 and 27 in Japanese.

Navigational Warnings

K: 0140 0540 0940 1340 1740 2140	Storm warnings, gale warnings, near gale warnings and fog (visibility) warnings for Sea Areas 2, 4, 5 and 7–12 in English. Tsunami warnings and advice from the Tsunami Warning Centres in English on receipt.
H: 0110 0510 0910 1310 1710 2110	Storm warnings, gale warnings, near gale warnings and fog (visibility) warnings for Sea Areas 13, 16–19, 25, 26, 28–30, 32 and 33 in English. Tsunami warnings and advice from the Tsunami Warning Centres in English on receipt.
G: 0100 0500 0900 1300 1700 2100	Storm warnings, gale warnings, near gale warnings and fog (visibility) warnings for Sea Areas 26, 27 and 30–37 in English. Tsunami warnings and advice from the Tsunami Warning Centres in English on receipt.
J: 0130 0530 0930 1330 1730 2130	Storm warnings, gale warnings, near gale warnings and fog (visibility) warnings for Sea Areas 1, 3, 4, 6, 7 and 13–16 in English. Tsunami warnings and advice from the Tsunami Warning Centres in English on receipt.
I: 0120 0520 0920 1320 1720 2120	Storm warnings, gale warnings, near gale warnings and fog (visibility) warnings for Sea Areas 11, 12, 20–24, 26 and 27 in English. Tsunami warnings and advice from the Tsunami Warning Centres in English on receipt.
K: 0108 0508 0908 1308 1708 2108	Storm warnings, gale warnings, near gale warnings and fog (visibility) warnings for Sea Areas 2, 4, 5 and 7–12 in Japanese. Tsunami warnings and advice from the Tsunami Warning Centres in Japanese on receipt.
H: 0017 0417 0817 1217 1617 2017	Storm warnings, gale warnings, near gale warnings and fog (visibility) warnings for Sea Areas 13, 16–19, 25, 26, 28–30, 32 and 33 in Japanese. Tsunami warnings and advice from the Tsunami Warning Centres in Japanese on receipt.
G: 0000 0400 0800 1200 1600 2000	Storm warnings, gale warnings, near gale warnings and fog (visibility) warnings for Sea Areas 26, 27 and 30–37 in Japanese. Tsunami warnings and advice from the Tsunami Warning Centres in Japanese on receipt.

Continued overleaf

JAPAN

NAVTEX (Continued)

J: 0051 0451 0851 1251 1651 2051	Storm warnings, gale warnings, near gale warnings and fog (visibility) warnings for Sea Areas 1, 3, 4, 6, 7 and 13–16 in Japanese. Tsunami warnings and advice from the Tsunami Warning Centres in Japanese on receipt.
I: 0034 0434 0834 1234 1634 2034	Storm warnings, gale warnings, near gale warnings and fog (visibility) warnings for Sea Areas 11, 12, 20–24, 26 and 27 in Japanese. Tsunami warnings and advice from the Tsunami Warning Centres in Japanese on receipt.
NOTE: All 424 kHz broadcasts are transmitted on low power for local coverage.	

MARITIME SAFETY INFORMATION (MSI) ON THE INTERNET

The internet is not part of the Maritime Safety Information system and should never be relied upon as the only means to obtain the latest forecast and warning information. Access to the service may be interrupted or delayed from time to time, updates may also be delayed. Please refer to GMDSS services, INMARSAT SafetyNET or international NAVTEX for the latest information. However, the following website(s) may prove useful to the mariner:

www1.kaiho.mlit.go.jp/TUHO/keiho/navarea11_en.html	Japanese Coast Guard	Navarea XI and local Navigational Warnings, together with Notices to Mariners and tidal information, in English and Japanese.

LOCAL WEATHER INFORMATION SERVICE BY DIFFERENTIAL GPS

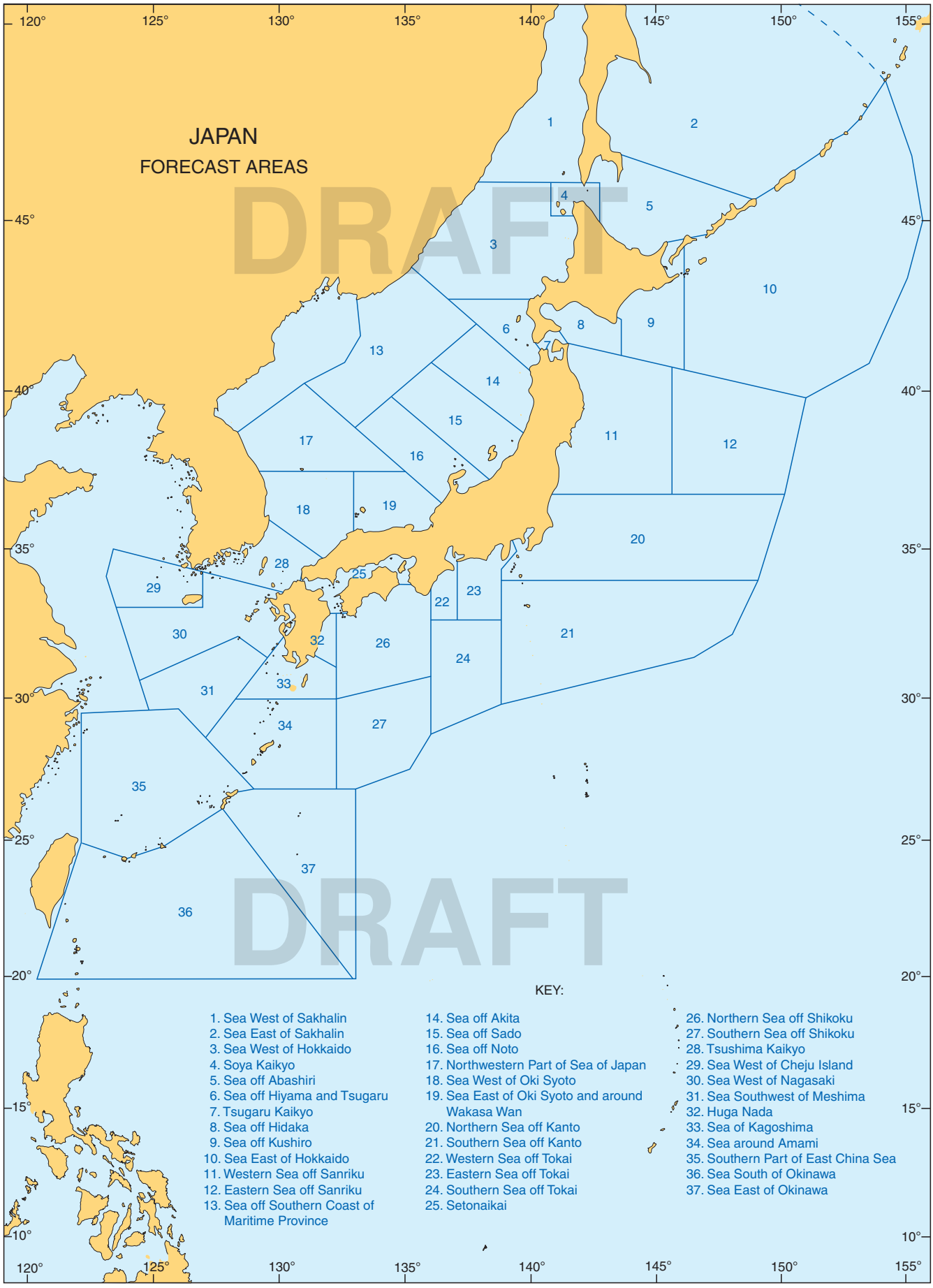
The Japan Coast Guard (JCG) has been providing differential correction of GPS signals on MF to improve the GPS positioning accuracy. In addition to providing differential corrections, the differential GPS service has the ability to provide useful navigational information such as weather conditions to vessels.

Broadcast Stations and Observatories

Broadcast stations, information format and the receiver's reaction are as follows:

Stations	Position	Identification No.	Frequency (kHz)	Observatories
Abashiri	43°59'·87N 144°18'·37E	631	309	Kanedanomisaki, Notoromisaki, Nosappumisaki, Kushiroko, Erimo, Yagishirito
Daio Saki	34°16'·71N 136°54'·05E	646	288	Shinomisaki, Togashirashima, Gozasaki, Daiosaki, Iragomisaki, Omaesaki
E Saki	34°35'·89N 134°59'·54E	648	320·5	Murotosaki, Magosaki, Jizosaki, Esaki, Tomogashima, Shionomisaki
Gesashi	26°36'·28N 128°09'·10E	655	288	Irisaki, Hirakubosaki, Ikemashima, Kumeshima, Iheyashima, Kunigamimisaki
Hachijo Shima	33°04'·77N 139°51'·32E	644	302	Hachijoshima, Omaesaki, Irosaki, Izuoshima, Katsuura, Inubosaki
Hamada Ko	34°52'·69N 132°02'·34E	635	305	Mitushima, Mishima, Iwamiosakihana, Mitabesaki, Saigomisaki, Kyogamisaki
Hekura Shima	37°51'·14N 136°55'·22E	637	295	Mitabesaki, Kyogamisaki, Hegura, Torigakubimisaki, Sawasakihana, Hajikisaki
Inubo Saki Lt	35°42'·48N 140°52'·11E	641	295	Hachijoshima, Izuoshima, Nojima, Katsuura, Inubosaki, Shioyasaki
Kinkasan To Lt	38°16'·64N 141°34'·95E	640	316	Inubosaki, Shioyasaki, Kinkasan, Todogasaki, Shiriyasaki, Erimo
Kushiro Saki	42°58'·11N 144°22'·49E	630	288	Shiriyasaki, Samekado, Erimo, Tokachiotsu, Kushiroko, Nosappumisaki
Matsumae	41°25'·34N 140°05'·22E	634	309	Benkeimisaki, Nyudosaki, Tappisaki, Matsumaekoshima, Matsumae, Aonaemisaki
Miyako Shima	24°43'·82N 125°26'·17E	656	316	Irisaki, Hirakubosaki, Ikemashima, Kumeshima, Iheyashima, Kunigamimisaki
Muroto Saki	33°15'·10N 134°10'·61E	647	295	Tosaokinoshima, Ashizurimisaki, Murotosaki, Tomogashima, Shionomisaki, Daiosaki
Nagoya	35°01'·90N 136°50'·90E	645	320	Togashirashima, Daiosaki, Yokkaichi, Namigasaki, Iragomisaki, Omaesaki
Nakano Shima Lt	29°49'·42N 129°54'·87E	654	320·5	Kasarisaki, Nakanoshima, Kusagakishima, Satamisaki, Toimisaki, Itesaki
Ohama	34°05'·40N 132°59'·48E	649	321	Sadamisaki, Yashima, Ujina, Imabari, Mushima, Aonoyama

Continued on page 177



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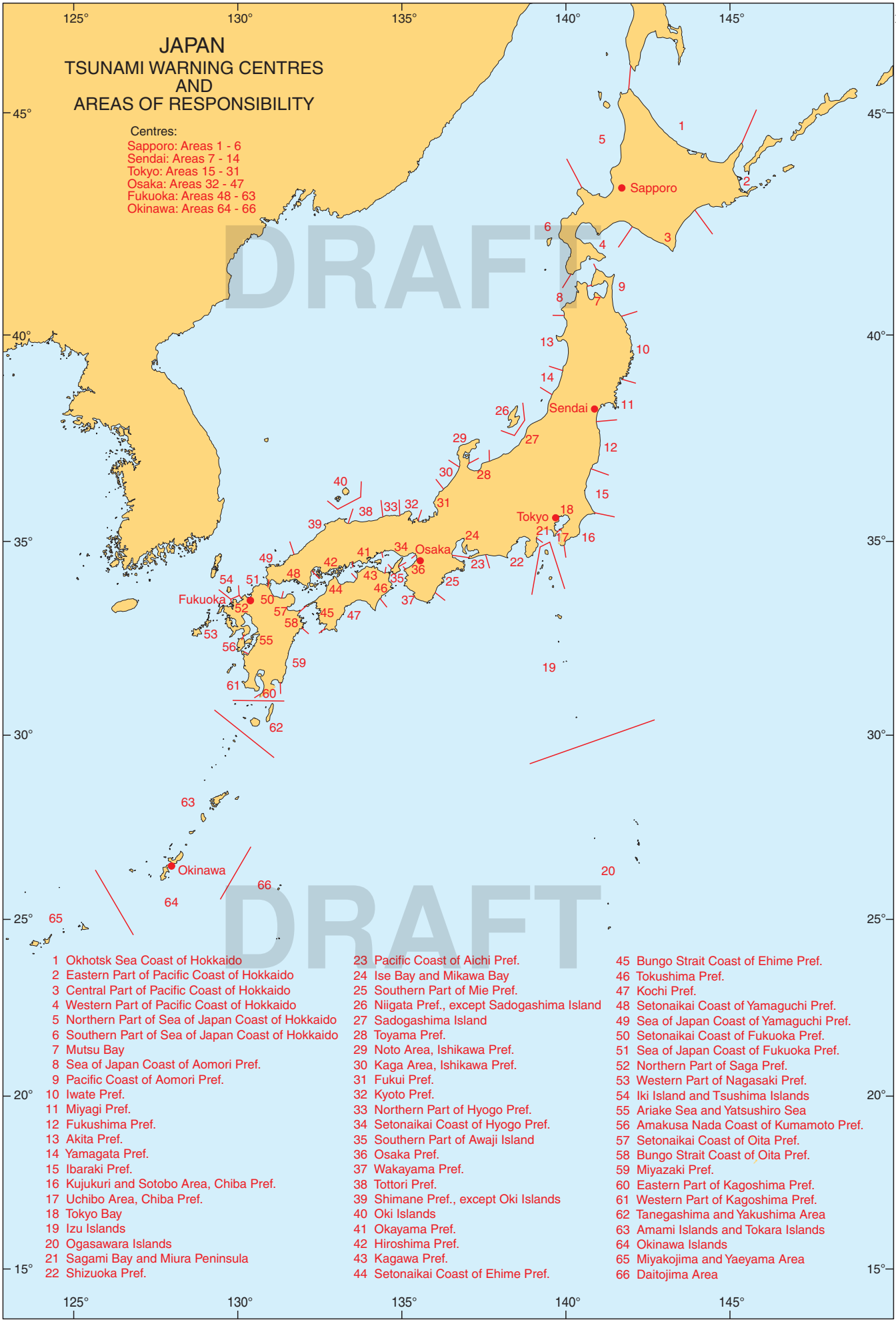
JAPAN
TSUNAMI WARNING CENTRES
AND
AREAS OF RESPONSIBILITY
Centres:
Sapporo: Areas 1 - 6
Sendai: Areas 7 - 14
Tokyo: Areas 15 - 31
Osaka: Areas 32 - 47
Fukuoka: Areas 48 - 63
Okinawa: Areas 64 - 66
DRAFT
DRAFT
V3(2)TSUNAMI V003 04/10/10
125°
130°
135°
140°
145°
45°
40°
35°
30°
25°
20°
15°
Sapporo
Sendai
Tokyo
Osaka
Fukuoka
Okinawa
1 Okhotsk Sea Coast of Hokkaido
2 Eastern Part of Pacific Coast of Hokkaido
3 Central Part of Pacific Coast of Hokkaido
4 Western Part of Pacific Coast of Hokkaido
5 Northern Part of Sea of Japan Coast of Hokkaido
6 Southern Part of Sea of Japan Coast of Hokkaido
7 Mutsu Bay
8 Sea of Japan Coast of Aomori Pref.
9 Pacific Coast of Aomori Pref.
10 Iwate Pref.
11 Miyagi Pref.
12 Fukushima Pref.
13 Akita Pref.
14 Yamagata Pref.
15 Ibaraki Pref.
16 Kujukuri and Sotobo Area, Chiba Pref.
17 Uchibo Area, Chiba Pref.
18 Tokyo Bay
19 Izu Islands
20 Ogasawara Islands
21 Sagami Bay and Miura Peninsula
22 Shizuoka Pref.
23 Pacific Coast of Aichi Pref.
24 Ise Bay and Mikawa Bay
25 Southern Part of Mie Pref.
26 Niigata Pref., except Sadogashima Island
27 Sadogashima Island
28 Toyama Pref.
29 Noto Area, Ishikawa Pref.
30 Kaga Area, Ishikawa Pref.
31 Fukui Pref.
32 Kyoto Pref.
33 Northern Part of Hyogo Pref.
34 Setonaikai Coast of Hyogo Pref.
35 Southern Part of Awaji Island
36 Osaka Pref.
37 Wakayama Pref.
38 Tottori Pref.
39 Shimane Pref., except Oki Islands
40 Oki Islands
41 Okayama Pref.
42 Hiroshima Pref.
43 Kagawa Pref.
44 Setonaikai Coast of Ehime Pref.
45 Bungo Strait Coast of Ehime Pref.
46 Tokushima Pref.
47 Kochi Pref.
48 Setonaikai Coast of Yamaguchi Pref.
49 Sea of Japan Coast of Yamaguchi Pref.
50 Setonaikai Coast of Fukuoka Pref.
51 Sea of Japan Coast of Fukuoka Pref.
52 Northern Part of Saga Pref.
53 Western Part of Nagasaki Pref.
54 Iki Island and Tsushima Islands
55 Ariake Sea and Yatsushiro Sea
56 Amakusa Nada Coast of Kumamoto Pref.
57 Setonaikai Coast of Oita Pref.
58 Bungo Strait Coast of Oita Pref.
59 Miyazaki Pref.
60 Eastern Part of Kagoshima Pref.
61 Western Part of Kagoshima Pref.
62 Tanegashima and Yakushima Area
63 Amami Islands and Tokara Islands
64 Okinawa Islands
65 Miyakojima and Yaeyama Area
66 Daitojima Area

JAPAN

Local Weather Information Service by Differential GPS (Continued)

Stations	Position	Identification No.	Frequency (kHz)	Observatories
Ose Saki	32°37'·02N 128°36'·37E	652	302	Meshima, Osesaki, Tushimasehana, Wakamiya, Kusagakishima, Itesaki
Sakata	38°56'·77N 139°49'·36E	638	288	Hegura, Hajikisaki, Tobishima, Nyudosaki, Akita, Henashisaki
Seto	33°26'·04N 132°13'·22E	650	320	Wakamiya, Daibahana, Toimisaki, Tsurumisaki, Sadamisaki, Tosaokinoshima
Shakotan Misaki	43°22'·30N 140°28'·02E	633	316	Aonaemisaki, Benkeimisaki, Kamuimisaki, Shakotanmisaki, Teurito, Yagishirito
Shiriya Saki	41°25'·72N 141°27'·68E	639	302	Matsumaekoshima, Omasaki, Esanmisaki, Shiriyasaki, Todogasaki, Erimo
Soya Misaki Lt	45°31'·19N 141°56'·16E	632	295	Kamuimisaki, Shakotanmisaki, Kanedanomisaki, Teurito, Yagishirito, Notoromisaki
Tanga	35°44'·33N 135°05'·20E	636	316	Mitabesaki, Nagaohana, Kyogamisaki, Tateishmisaki, Echizenmisaki, Hegura
Toi Misaki	31°22'·39N 131°20'·07E	653	309	Nakanoshima, Satamisaki, Toimisaki, Hososhima, Tosaokinoshima, Ashizurimisaki
Tsurugi Saki (Ken Saki)	35°08'·47N 139°40'·50E	643	309	Omaesaki, Irosaki, Izuoshima, Hachijoshima, Tsurugisaki, Sunosaki
Urayasu	35°37'·02N 139°53'·85E	642	321	Kannonsaki, Honmoku, Tokyo, Umihotaru, Dainikaiho, Sunosaki
Wakamiya Shima Lt	33°52'·15N 129°41'·19E	651	295	Wakamiya, Tsutsusaki, Mitushima, Chikuzenainoshima, Tushimasehana, Mishima

Information Format: observatory, time, wind direction, wind speed, atmospheric pressure and wave height.
Display example: Erimo, 0930, NNE, 3 m/s, 1020 hPa, Wave 1 m.
Any item which can not be observed is omitted from the display.
When it is impossible to observe any of the above items, "NO WEATHER INFORMATION" will be transmitted.

DGPS Receiver's reaction:
When a DGPS receiver is in receipt of weather information, the receiver may react as follows:
Sound an alarm such as a "beep"
Change to another screen display without sounding an alarm.
Some DGPS receivers do not have the ability to receive weather information.
For further details of this service please contact:

Differential GPS Navigation System Centre,
Aids to Navigation Management Division,
Maritime Traffic Department,
Japan Coast Guard,
2-1-3 Kasumigaseki, Chiyoda-ku,
Tokyo 100-8918,
Japan
Tel: +81 3 35919566
Fax: +81 3 35919737

HIROSHIMA (HIROSHIMA MRCC) (JNE)				
Control Centre: 34°21'·26N 132°28'·06E				
	Ch 16	VHF	Noro	34°15'·00N 132°40'·00E
Diagrams pages 175 and 176				
Navigational Warnings				
On receipt	Storm warnings and local Navigational Warnings in Japanese and English.			
1015 1615 LT	Local Navigational Warnings in Japanese and English.			

JAPAN

HOKKAIDO (OTARU MRCC) (JNL)				
Control Centre: 43°12′·00N 141°00′·25E				
	Ch 16	VHF		
Diagrams pages 175 and 176				
Navigational Warnings				
On receipt	Storm warnings and local Navigational Warnings in Japanese and English.			
1025 1625 LT	Local Navigational Warnings in Japanese and English.			

KAGOSHIMA (KAGOSHIMA MRCC) (JNJ)				
Control Centre: 31°33′·26N 130°32′·91E				
	Ch 16	VHF		
Diagrams pages 175 and 176				
Navigational Warnings				
On receipt	Storm warnings and local Navigational Warnings in Japanese and English.			
1020 1620 LT	Local Navigational Warnings in Japanese and English.			

KOBE (KOBE MRCC) (JGD)				
Control Centre: 34°21′·00N 134°50′·00E				
	Ch 16	VHF		
Diagrams pages 175 and 176				
Navigational Warnings				
On receipt	Storm warnings and local Navigational Warnings in Japanese and English.			
1033 1633 LT	Local Navigational Warnings in Japanese and English.			

MAIZURU (MAIZURU MRCC) (JNC)				
Control Centre: 35°27′·04N 135°19′·05E				
	Ch 16	VHF		
Diagrams pages 175 and 176				
Navigational Warnings				
On receipt	Storm warnings and local Navigational Warnings in Japanese and English.			
1020 1620 LT	Local Navigational Warnings in Japanese and English.			

MOJI (KITAKYUSHI MRCC) (JNR)				
Control Centre: 33°52′·00N 130°35′·00E				
	Ch 16	VHF		
Diagrams pages 175 and 176				
Navigational Warnings				
On receipt	Storm warnings and local Navigational Warnings in Japanese and English.			
1003 1603 LT	Local Navigational Warnings in Japanese and English.			

NAGOYA (NAGOYA MRCC) (JNT)				
Control Centre: 35°04′·00N 136°40′·00E				
	Ch 16	VHF		
Diagrams pages 175 and 176				
Navigational Warnings				
On receipt	Storm warnings and local Navigational Warnings in Japanese and English.			
1010 1610 LT	Local Navigational Warnings in Japanese and English.			

JAPAN

NIIGATA (NIIGATA MRCC) (JNV)				
Control Centre: 37°55′·26N 139°03′·11E				
	Ch 16	VHF		
Diagrams pages 175 and 176				
Navigational Warnings				
On receipt	Storm warnings and local Navigational Warnings in Japanese and English.			
1015 1615 LT	Local Navigational Warnings in Japanese and English.			

OKINAWA (NAHA MRCC) (JNB)				
Control Centre: 26°14′·50N 127°41′·63E				
	Ch 16	VHF		
Diagrams pages 175 and 176				
Navigational Warnings				
On receipt	Storm warnings and local Navigational Warnings in Japanese and English.			
1010 1610 LT	Local Navigational Warnings in Japanese and English.			

SHIOGAMA (SHIOGAMA MRCC) (JNN)				
Control Centre: 38°18′·90N 141°02′·15E				
	Ch 16	VHF		
Diagrams pages 175 and 176				
Navigational Warnings				
On receipt	Storm warnings and local Navigational Warnings in Japanese and English.			
1033 1633 LT	Local Navigational Warnings in Japanese and English.			

YOKOHAMA (YOKOHAMA MRCC) (JGC)				
Control Centre: 35°27′·03N 139°38′·24E				
	Ch 16	VHF		
Diagrams pages 175 and 176				
Navigational Warnings				
On receipt	Storm warnings and local Navigational Warnings in Japanese and English.			
1020 1620 LT	Local Navigational Warnings in Japanese and English.			

KIRIBATI

INTERNET WEATHER SERVICES	
Kiribati Meteorological Service www.met.gov.ki/en/marine/marine-forecast	Marine forecasts (issued by the Fiji Meteorological Service) and tidal information, in English.

TARAWA (T3C)				
Control Centre: 1°21′·31N 172°55′·30E				
	4387	RT (HF)		
Weather Bulletins				
Every even H+00	Gale warnings and forecast for local waters.			

KOREA, NORTH

NAVTEX

E	Hamhŭng	518 kHz	39°50′·00N 127°41′·02E
D	Pyongyang		38°59′·58N 125°42′·93E
B	Hamhŭng	490 kHz	39°50′·00N 127°41′·02E
A	Pyongyang		38°59′·58N 125°42′·93E

Diagram page 38

Weather Bulletins

E: 0040 0440 0840 1240 1640 2040 D: 0030 0430 0830 1230 1630 2030	Weather bulletins in English.
B: 0010 0410 0810 1210 1610 2010 A: 0000 0400 0800 1200 1600 2000	Weather bulletins in Korean.

Navigational Warnings

E: 0040 0440 0840 1240 1640 2040 D: 0030 0430 0830 1230 1630 2030	Navigational Warnings in English.
B: 0010 0410 0810 1210 1610 2010 A: 0000 0400 0800 1200 1600 2000	Navigational Warnings in Korean.

KOREA, SOUTH

INTERNET WEATHER SERVICES

Korean Hydrographic and Oceanographic Administration www.khoa.go.kr/koofs/eng/observation/obs_real.do	Real time coastal data including tidal and meteorological information, in Korean and English.

NAVTEX

V	Jukbyeon	518 kHz	37°03′·49N 129°25′·77E
W	Pyŏnsan (Byeonsan)		35°35′·81N 126°29′·17E
J	Jukbyeon	490 kHz	37°03′·49N 129°25′·77E
K	Pyŏnsan (Byeonsan)		35°35′·81N 126°29′·17E

Diagrams pages 38 and 181

Weather Bulletins

V: 0330 0730 1130 1530 1930 2330 W: 0340 1140 1540 2340	Weather bulletins in English.
J: 0130 0530 0930 1330 1730 2130 K: 0540 0940 1740 2140	Weather bulletins in Korean.

Navigational Warnings

V: 0330 0730 1130 1530 1930 2330 W: 0340 0740 1140 1540 1940 2340	Navigational Warnings in English.
J: 0130 0530 0930 1330 1730 2130 K: 0140 0540 0940 1340 1740 2140	Navigational Warnings in Korean.

MARITIME SAFETY INFORMATION (MSI) ON THE INTERNET

The internet is not part of the Maritime Safety Information system and should never be relied upon as the only means to obtain the latest forecast and warning information. Access to the service may be interrupted or delayed from time to time, updates may also be delayed. Please refer to GMDSS services, INMARSAT SafetyNET or international NAVTEX for the latest information. However, the following website(s) may prove useful to the mariner:

www.khoa.go.kr/eng/	Korean Hydrographic and Oceanographic Administration	Select *Information* from the main menu and then *Notice to Mariners*, available as PDF downloads in Korean and English.

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KOREA, SOUTH

CHEJU (JEJU) (HLE)				
Control Centre: 33°16′·25N 126°13′·20E				
	2299	RT (MF)		
Diagram page 181				
Navigational Warnings				
0902 1702	Navigational Warnings in Korean and English.			

INCH'ŎN (INCHEON) (HLC)				
Control Centre: 37°25′·23N 126°38′·67E				
	2284	RT (MF)		
Diagram page 181				
Navigational Warnings				
0003	Navigational Warnings in Korean and English.			

KANGNUNG (HLK)				
Control Centre: 37°46′·40N 128°55′·70E				
	2836	RT (MF)		
Diagram page 181				
Navigational Warnings				
0903	Navigational Warnings in Korean and English.			

KUNSAN (GUNSAN) (HLN)				
Control Centre: 35°59′·19N 126°42′·97E				
	2507	RT (MF)		
Diagram page 181				
Navigational Warnings				
0403	Navigational Warnings in Korean and English.			

MALAYSIA

INTERNET WEATHER SERVICES	
Malaysian Meteorological Department www.met.gov.my	Marine weather forecast in Malayan and English.

NAVTEX			
T	Miri (Sarawak)	518 kHz	4°26′·42N 114°01′·51E
U	Penang		5°25′·58N 100°24′·40E
S	Sandakan (Sabah)		5°53′·85N 118°00′·24E
Diagrams pages 37, 187 and 188			
Weather Bulletins			
T: 0310 1510 U: 0320 1520 S: 0300 1500	Weather bulletins.		
Navigational Warnings			
T: 0310 0710 1110 1510 1910 2310 U: 0320 0720 1120 1520 1920 2320 S: 0300 0700 1100 1500 1900 2300	Navigational Warnings.		

MALAYSIA

MARITIME SAFETY INFORMATION (MSI) ON THE INTERNET

The internet is not part of the Maritime Safety Information system and should never be relied upon as the only means to obtain the latest forecast and warning information. Access to the service may be interrupted or delayed from time to time, updates may also be delayed. Please refer to GMDSS services, INMARSAT SafetyNET or international NAVTEX for the latest information. However, the following website(s) may prove useful to the mariner:

www.marine.gov.my	Marine Department of Malaysia	Select language required and then Notice from the main menu, in order to view Notices to Mariners.

SUBMARINE EXERCISE AREAS

Malaysia has notified its establishment of three permanent submarine exercise areas (MSEA 1–3). Its stated aim is to provide safe areas for submarines to conduct operations and exercises.

To facilitate the safety of submarine operations, Malaysia instructs mariners to notify both the Malaysian National Security Council and the Submarine Control Centre, at least 7 days prior to commencement, of any of the following activities in these areas (Malaysia states that it will not be responsible for any damage to or loss of ships, equipment and life caused by failure to notify).

1 Weapons firing (including from aircraft).
2 Towed appliances e.g. Variable Depth Sonars etc.
3 Any activity involving mines.
4 Submersible operations including ROV and divers.
5 Deep-sea drilling and oil/gas exploration activities.
6 Any type of survey.
7 Any other activity that may jeopardise the safety of submarines.

National Security Council (Coordinating Agency)	RMN Submarine Command Headquarters
Level 2, West Block Perdana Putra Building Federal Government Administrative Centre 62502 PUTRAJAYA Malaysia. Telephone : +603 88726846 or 88882010 Fax : +603 88883091 or 88883022 Email : bkkm@mkn.gov.my bppon@mkn.gov.my	Kota Kinabalu Naval Base Sepangar Bay 88846 KOTA KINABALU Sabah, Malaysia Phone : +6088 473390 or 478002/478010 Fax : +6088 473514 Email : pkkstldm@navy.mil.my
Diagrams pages 185 and 186	

MALAYSIA, PENINSULAR

PENANG (9MG)

Control Centre: 5°25′·58N 100°24′·40E

	522·5	WT (MF)	Penang	5°25′·58N 100°24′·40E
	Ch 16	VHF	Kuantan	3°58′·18N 103°25′·98E
			Port Klang	2°59′·00N 101°29′·00E
Diagrams pages 187 and 188				
Navigational Warnings				
0148 0548 0948 1348 1748 2148	Coastal Navigational Warnings.			

MALDIVES

INTERNET WEATHER SERVICES

Maldives Meteorological Service www.meteorology.gov.mv/marineweather	Coastal marine forecasts and weather warnings, in English and Dhivehi.

MARSHALL ISLANDS

FIRING PRACTICE AREA - REAGAN TEST SITE

Approximate Position: 8°43′·00N 167°43′·00E

Reagan Test Site – Warning Area covers a circular area with a radius of 200 n miles, centred at Kwajalein Atoll (8°43'N, 167°43'E). Intermittent hazardous missile operations are conducted within the area.
Twenty four hours prior to operations, "Range Command Center" will broadcast a voice warning on 2716 kHz. Range operations are also usually covered by HYDROPAC messages (See Guam for details). For further information contact the Reagan Test Site Range Safety Office Tel: +1 256 9552986 or +1 256 9552987.

MARTINIQUE (France)

CROSS ANTILLES-GUYANE (CROSS-AG) FORT-DE-FRANCE MRCC

Control Centre: 14°36′·09N 61°05′·49W

Martinique				
A	2545	RT (MF)	Martinique	14°36′·00N 61°04′·00W
B	Ch 80	VHF	Bellefontaine (Morne Capot)	14°41′·18N 61°08′·78W
C			Caravelle (Morne Pavillon)	14°45′·31N 60°54′·72W
D	Ch 79		Grande Rivière (Beauséjour)	14°52′·23N 61°10′·37W
E			Le Marin (Morne Acca)	14°27′·56N 60°54′·06W
Guadeloupe				
F	Ch 79	VHF	Basse-Terre (Morne á Louis)	16°11′·18N 61°44′·97W
G	Ch 80		Basse-Terre (Piton Ste Rose)	16°19′·90N 61°45′·72W
H			Basse-Terre (Vieux Fort)	15°57′·37N 61°42′·05W
I	Ch 64		Marie-Galante (Beauregard)	15°53′·80N 61°15′·68W
Saint Martin				
J	Ch 64	VHF	Pic Paradis	18°04′·51N 63°03′·02W
French Guiana				
K	Ch 80	VHF	Cayenne	4°55′·00N 52°18′·00W
L	Ch 79		Île du Salut (Salvation Islands)	5°17′·00N 52°35′·00W
M	Ch 80		Iracoubo	5°28′·00N 53°12′·00W
N	Ch 79		Kaw	4°30′·00N 52°04′·00W
O			Mana	5°40′·19N 53°46′·90W

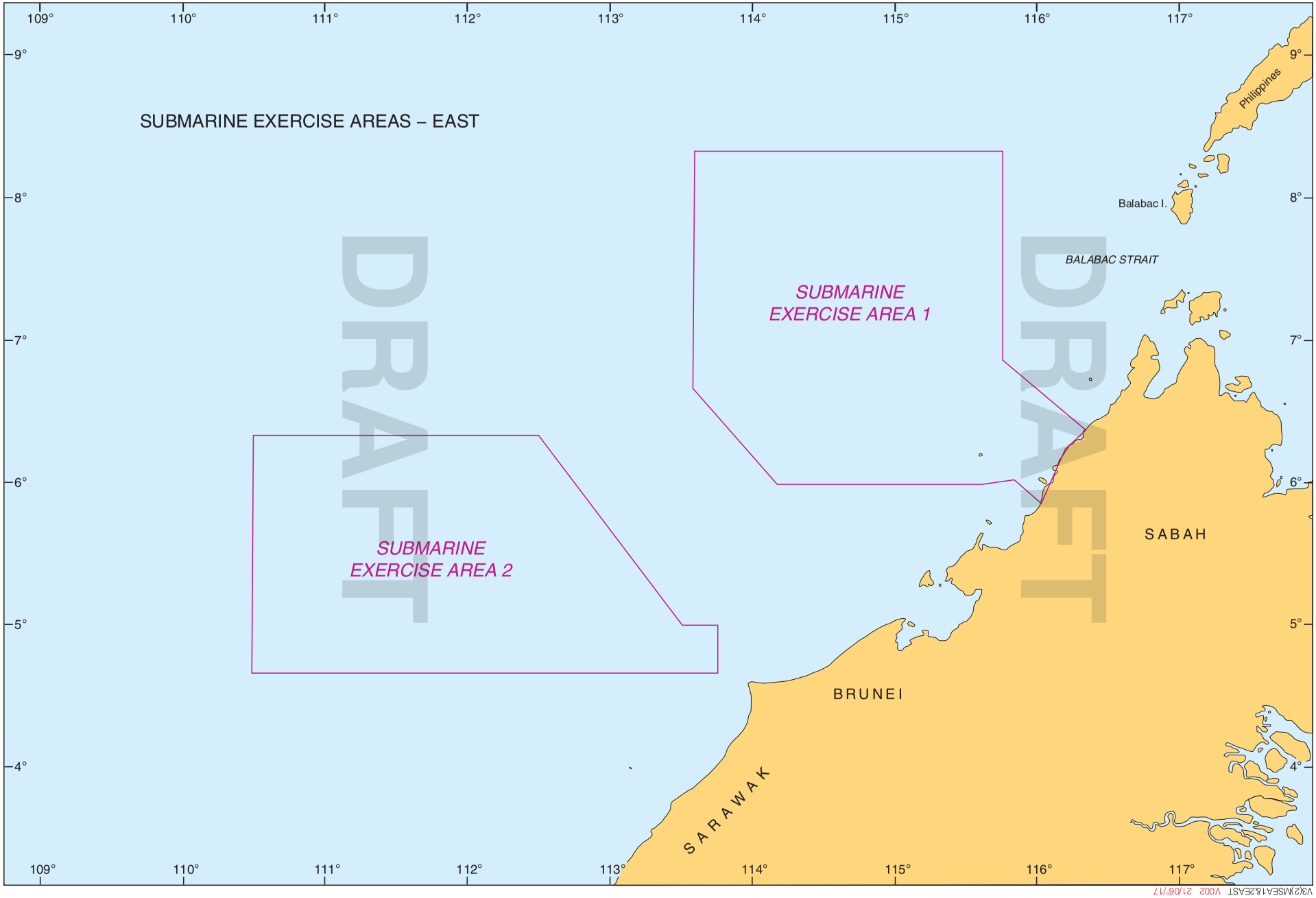
Weather Bulletins

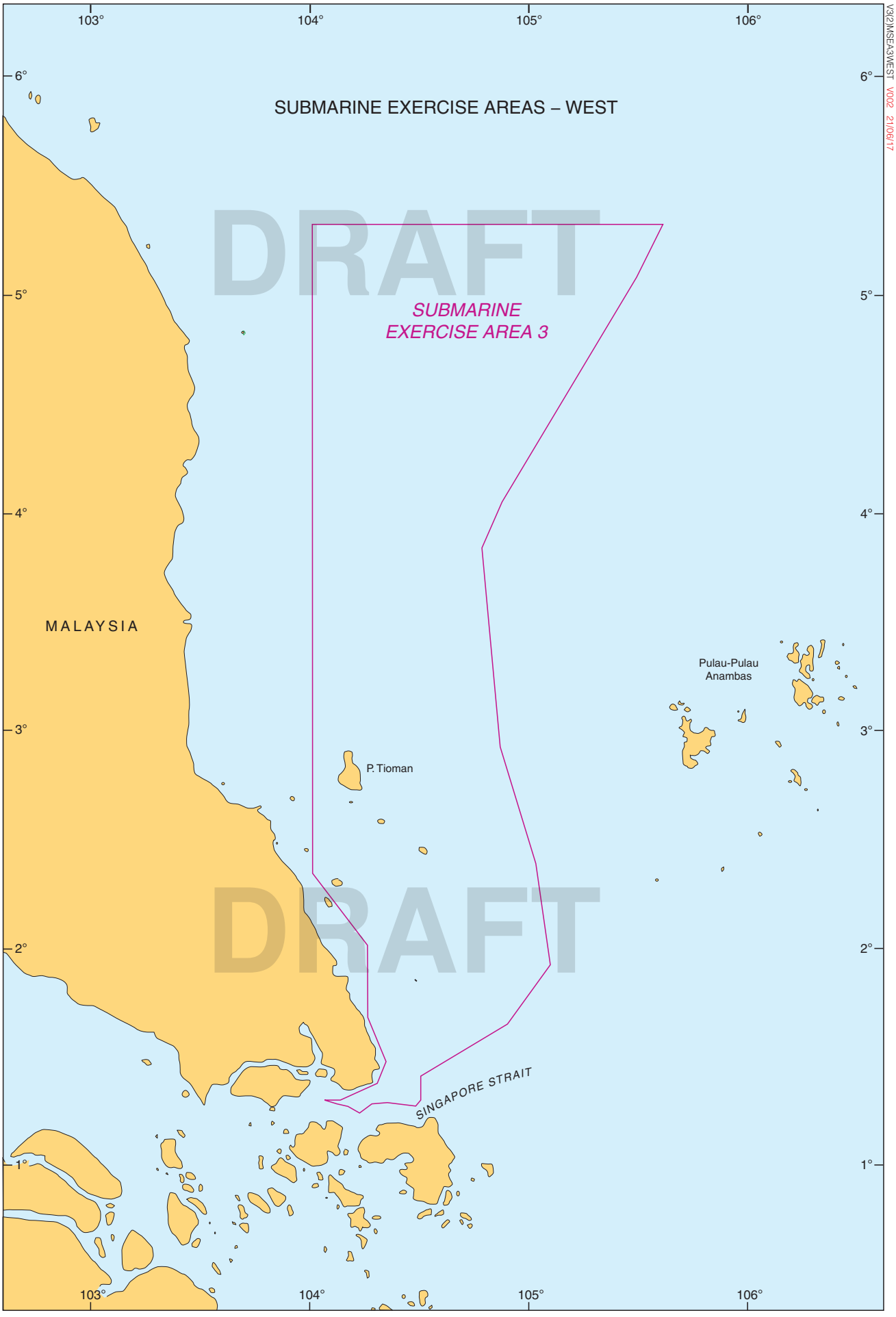
A: Every even H+00	Information on tropical phenomena (depressions, storms, hurricanes) for the area 10°N–20°N, 50°W–70°W in French and English.
B-J: Every H+30	Information on tropical phenomena (depressions, storms, hurricanes) for the area 10°N–20°N, 50°W–70°W in French.
A: 0930 1815	Storm warnings for the area 10°N–20°N, 50°W–70°W, synopsis for the North Atlantic south of 40°N, 24 hour forecast for the area 10°N–20°N, 57°W–65°W and outlook in French and English.
B: 0730 1100 1830 2030 **C:** 0750 1120 1850 2050 **D:** 0740 1110 1840 2040 **E:** 0720 1050 1820 2020 **F:** 0800 1130 1900 2100 **G:** 0810 1140 1910 2110 **H:** 0830 1200 1930 2130 **I:** 0820 1150 1920 2120 **J:** 0900 1230 2000 2200	Storm warnings, synopsis, 24 hour forecast and outlook for coastal waters up to 25 n miles offshore in French.
K: 0915 1315 1715 **L:** 0900 1300 1700 **M:** 0845 1245 1645 **N:** 0930 1330 1730 **O:** 0830 1230 1630	Weather bulletins for the coastal waters of French Guiana and the Île du Salut (Salvation Islands), in French.

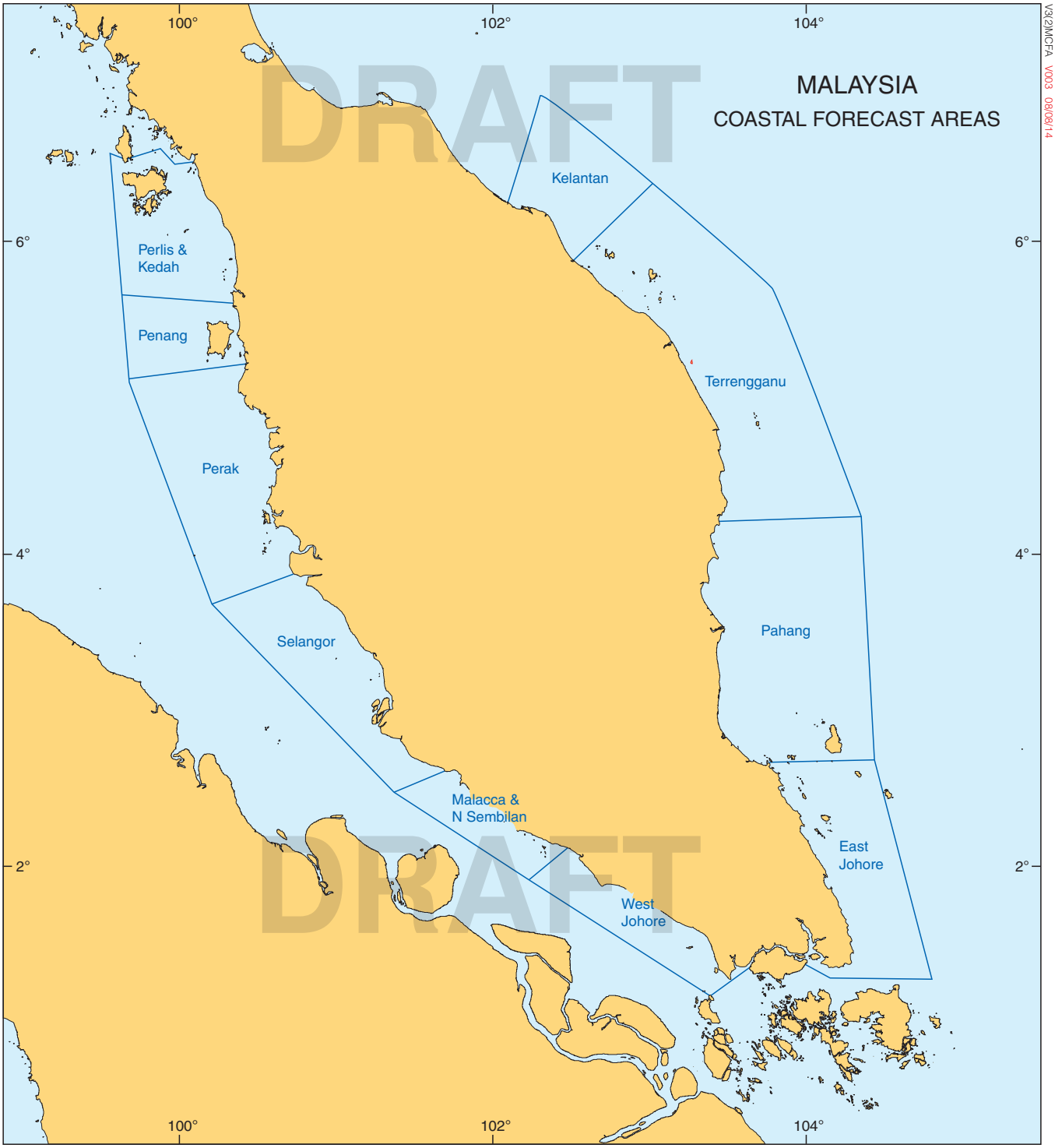
Navigational Warnings

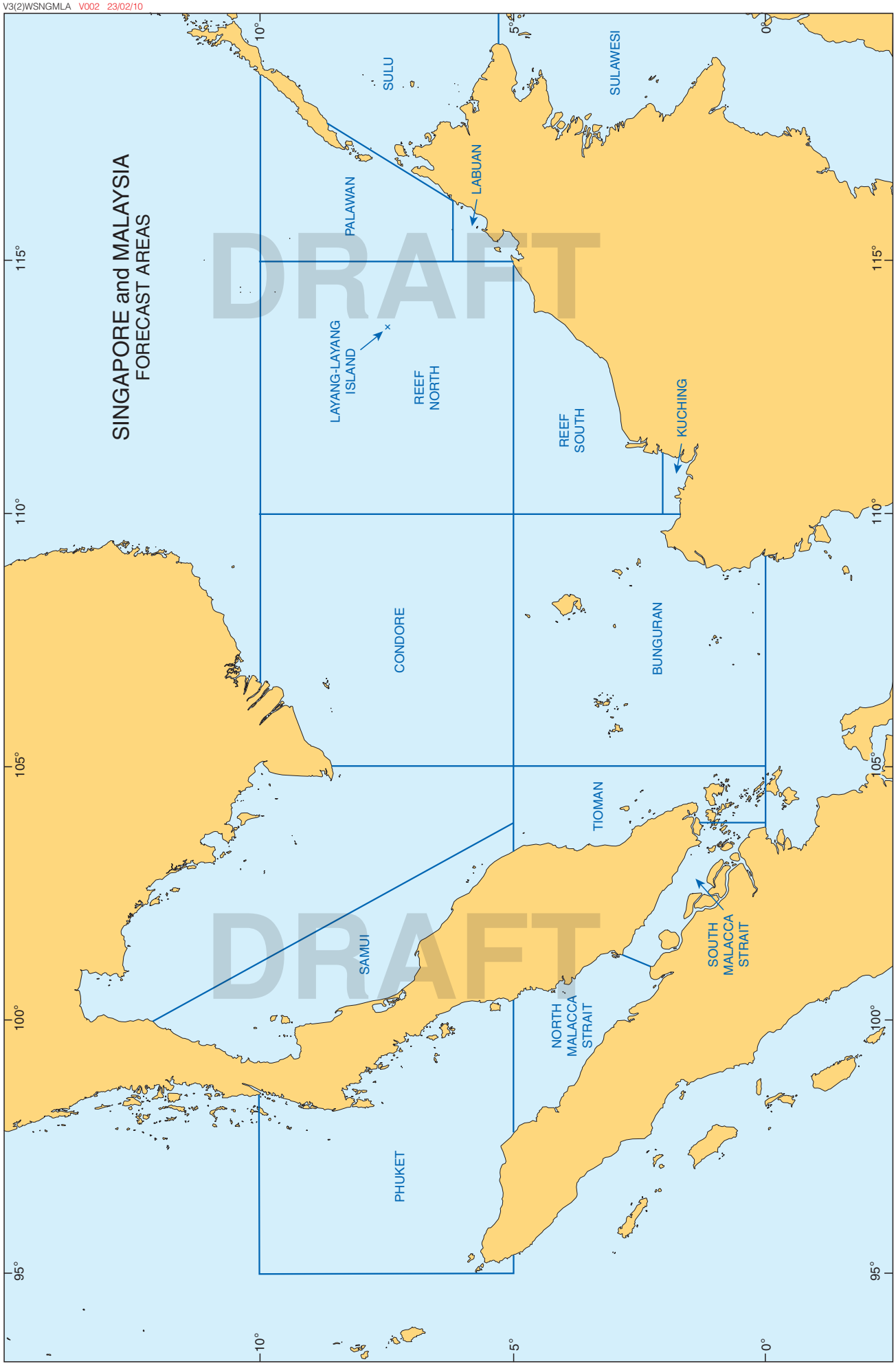
A: 0930 1815	Navigation Warnings for offshore sea areas in French.
B: 0730 1100 1830 2030 **C:** 0750 1120 1850 2050 **D:** 0740 1110 1840 2040 **E:** 0720 1050 1820 2020	Navigational Warnings for coastal waters of Martinique, after the weather bulletin, in French.

Continued on page 189


SUBMARINE EXERCISE AREAS – EAST
SUBMARINE EXERCISE AREA 1
SUBMARINE EXERCISE AREA 2
Philippines
Balabac I.
BALABAC STRAIT
SABAH
BRUNEI
SARAWAK
109°
110°
111°
112°
113°
114°
115°
116°
117°
9°
8°
7°
6°
5°
4°
DRAFT
DRAFT
V3(2)MSEA182EAST V002 21/06/17


SUBMARINE EXERCISE AREAS – WEST
V3(2)MSEA3WEST V002 21/06/17
DRAFT
SUBMARINE
EXERCISE AREA 3
DRAFT
103°
104°
105°
106°
6°
5°
4°
3°
2°
1°
MALAYSIA
P. Tioman
Pulau-Pulau
Anambas
SINGAPORE STRAIT


MALAYSIA
COASTAL FORECAST AREAS
DRAFT
DRAFT
100°
102°
104°
6°
4°
2°
Kelantan
Perlis &
Kedah
Penang
Terrengganu
Perak
Pahang
Selangor
Malacca &
N Sembilan
East
Johore
West
Johore
V3(2)MCFA V003 08/08/14


SINGAPORE and MALAYSIA
FORECAST AREAS
SULU
SULAWESI
PALAWAN
LABUAN
LAYANG-LAYANG
ISLAND
REEF
NORTH
REEF
SOUTH
KUCHING
CONDORE
BUNGURAN
TIOMAN
SAMUI
SOUTH
MALACCA
STRAIT
NORTH
MALACCA
STRAIT
PHUKET
DRAFT
DRAFT
10°
5°
0°
115°
110°
105°
100°
95°

MARTINIQUE (France)

CROSS ANTILLES-GUYANE (CROSS-AG) FORT-DE-FRANCE MRCC (Continued)

F: 0800 1130 1900 2100 **G:** 0810 1140 1910 2110 **H:** 0830 1200 1930 2130 **I:** 0820 1150 1920 2120	Navigational Warnings for coastal waters of Guadeloupe, including Firing Practice Area warnings, after the weather bulletin, in French.
J: 0900 1230 2000 2200	Navigational Warnings for coastal waters of the northern islands, after the weather bulletin, in French.
K: 0915 1315 1715 **L:** 0900 1300 1700 **M:** 0845 1245 1645 **N:** 0930 1330 1730 **O:** 0830 1230 1630	Navigation warnings for the coastal waters of French Guiana and the Île du Salut (Salvation Islands), after the weather bulletins, in French.
NOTE(S): 1. All times quoted are LT. 2. After prior announcement on 2182 kHz and VHF Ch 16. 3. Scheduled broadcasts may be suspended whilst SAR action is in progress. 4. BMS are broadcast on receipt and then at subsequent scheduled transmission times.	

MEXICO

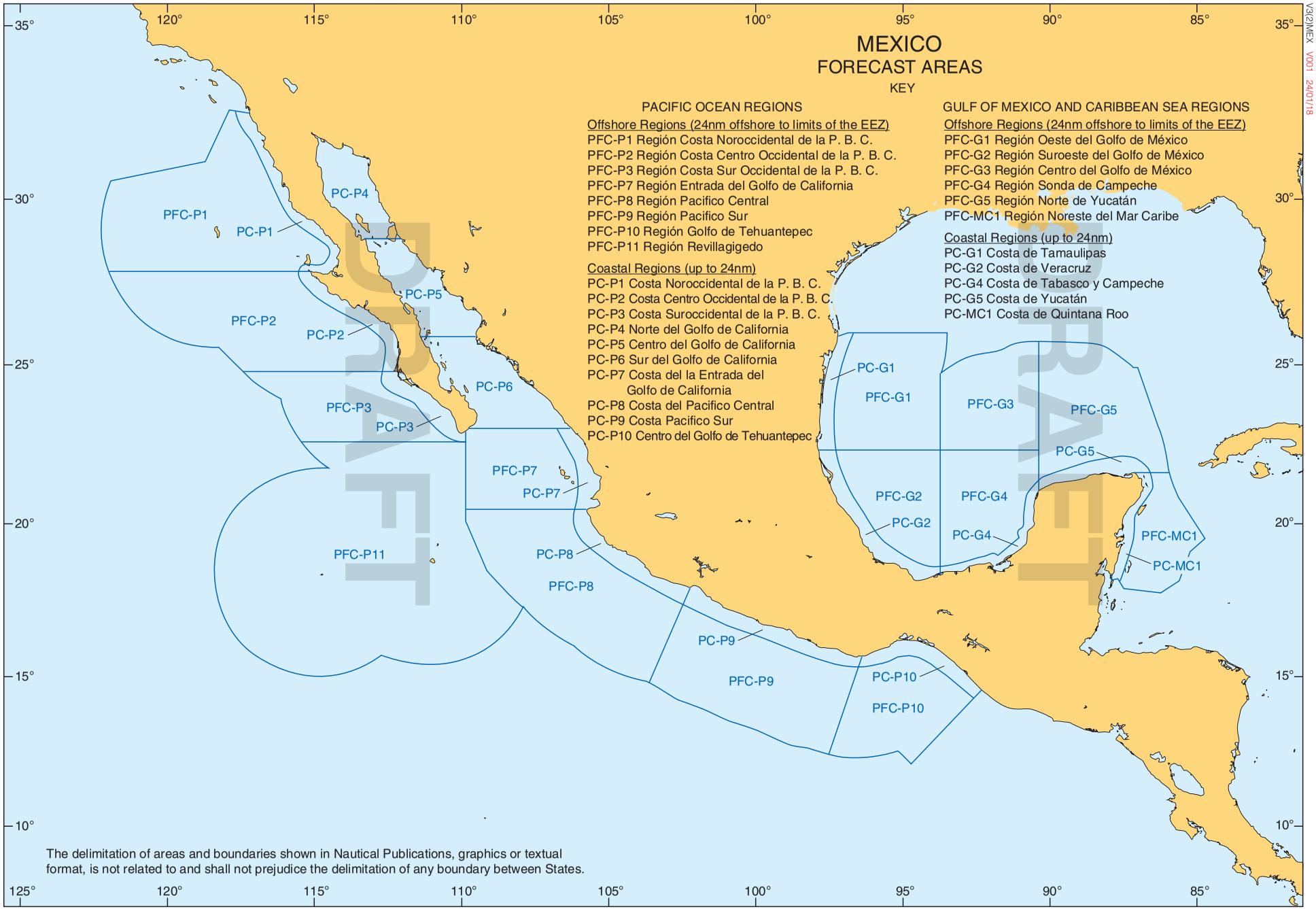
INTERNET WEATHER SERVICES	
Mexican National Meteorological Service http://smn.cna.gob.mx/es/	Marine weather warnings for the Pacific and Atlantic coasts.
Secretariat of Communications and Transportation www.sct.gob.mx/index.php?id=209	Marine weather bulletins for the Pacific and Atlantic coasts, issued twice a day at 1000 and 1600.
Directorate of Meteorology http://meteorologia.semar.gob.mx	Gerneral maritime synopsis and outlook for the Caribbean and Pacific coasts, together with marine forecasts for next 24, 48 and 72hrs, in Spanish.

MARITIME SAFETY INFORMATION (MSI) ON THE INTERNET		
The internet is not part of the Maritime Safety Information system and should never be relied upon as the only means to obtain the latest forecast and warning information. Access to the service may be interrupted or delayed from time to time, updates may also be delayed. Please refer to GMDSS services, INMARSAT SafetyNET or international NAVTEX for the latest information. However, the following website(s) may prove useful to the mariner:		
http://digaohm.semar.gob.mx/hidrografia/avisosalosmarinos.html	Mexican Hydrographic Office	Navigation Warnings in Spanish.
https://www.gob.mx/semar/unicapam/acciones-y-programas/seguridad-maritima-140390	Department of Ports and Maritime Affairs	Local Navigation Warnings, principle port meteorological conditions and operational status, in Spanish.

MEXICO (Caribbean and Gulf Coast)

CHETUMAL (XFP)				
Control Centre: 18°31′·48N 88°16′·80W				
	Ch 26	VHF		
Diagram page 190				
Weather Bulletins				
0335 0935 1535	Weather messages for shipping.			
Navigational Warnings				
0335 0935 1535	Navigational Warnings.			

CIUDAD DEL CARMEN (XFB)				
Control Centre: 18°38′·51N 91°50′·05W				
	Ch 26	VHF		
Diagram page 190				
Weather Bulletins				
0335 0935 1535	Weather messages for shipping.			
Navigational Warnings				
0335 0935 1535	Navigational Warnings.			


MEXICO
FORECAST AREAS
KEY
PACIFIC OCEAN REGIONS
Offshore Regions (24nm offshore to limits of the EEZ)
PFC-P1 Región Costa Noroccidental de la P. B. C.
PFC-P2 Región Costa Centro Occidental de la P. B. C.
PFC-P3 Región Costa Sur Occidental de la P. B. C.
PFC-P7 Región Entrada del Golfo de California
PFC-P8 Región Pacifico Central
PFC-P9 Región Pacifico Sur
PFC-P10 Región Golfo de Tehuantepec
PFC-P11 Región Revillagigedo
Coastal Regions (up to 24nm)
PC-P1 Costa Noroccidental de la P. B. C.
PC-P2 Costa Centro Occidental de la P. B. C.
PC-P3 Costa Suroccidental de la P. B. C.
PC-P4 Norte del Golfo de California
PC-P5 Centro del Golfo de California
PC-P6 Sur del Golfo de California
PC-P7 Costa del la Entrada del Golfo de California
PC-P8 Costa del Pacifico Central
PC-P9 Costa Pacifico Sur
PC-P10 Centro del Golfo de Tehuantepec
GULF OF MEXICO AND CARIBBEAN SEA REGIONS
Offshore Regions (24nm offshore to limits of the EEZ)
PFC-G1 Región Oeste del Golfo de México
PFC-G2 Región Suroeste del Golfo de México
PFC-G3 Región Centro del Golfo de México
PFC-G4 Región Sonda de Campeche
PFC-G5 Región Norte de Yucatán
PFC-MC1 Región Noreste del Mar Caribe
Coastal Regions (up to 24nm)
PC-G1 Costa de Tamaulipas
PC-G2 Costa de Veracruz
PC-G4 Costa de Tabasco y Campeche
PC-G5 Costa de Yucatán
PC-MC1 Costa de Quintana Roo
PFC-P1
PC-P1
PC-P4
PC-P5
PFC-P2
PC-P2
PC-P6
PFC-P3
PC-P3
PFC-P7
PC-P7
PFC-P11
PC-P8
PFC-P8
PC-P9
PFC-P9
PC-P10
PFC-P10
PC-G1
PFC-G1
PFC-G3
PFC-G5
PC-G5
PFC-G2
PFC-G4
PC-G2
PC-G4
PFC-MC1
PC-MC1
35°
30°
25°
20°
15°
10°
120°
115°
110°
105°
100°
95°
90°
85°
125°
The delimitation of areas and boundaries shown in Nautical Publications, graphics or textual format, is not related to and shall not prejudice the delimitation of any boundary between States.
DRAFT
V3(2)MEX V001 24/01/18

MEXICO (Caribbean and Gulf Coast)

COATZACOALCOS (XFF)				
Control Centre: 18°08′·85N 94°25′·11W				
	Ch 26	VHF		
Diagram page 190				
Weather Bulletins				
0335 0935 1535	Weather messages for shipping.			
Navigational Warnings				
0335 0935 1535	Navigational Warnings.			

COZUMEL (XFC)				
Control Centre: 20°28′·28N 86°58′·18W				
	Ch 26	VHF		
Diagram page 190				
Weather Bulletins				
0335 0935 1535	Weather messages for shipping.			
Navigational Warnings				
0335 0935 1535	Navigational Warnings.			

PROGRESO				
Control Centre: 21°16′·40N 89°42′·83W				
	Ch 26	VHF		
Diagram page 190				
Weather Bulletins				
0335 0935 1535	Weather messages for shipping.			
Navigational Warnings				
0335 0935 1535	Navigational Warnings.			

VERACRUZ (XFU)				
Control Centre: 19°08′·77N 96°07′·12W				
	Ch 26	VHF		
Diagram page 190				
Weather Bulletins				
0335 0935 1535	Weather messages for shipping.			
Navigational Warnings				
0335 0935 1535	Navigational Warnings.			

MEXICO (Pacific Coast)

ACAPULCO (XFA)				
Control Centre: 16°50′·68N 99°54′·82W				
A	Ch 25	VHF		
B	Ch 26			
Diagram page 190				
Weather Bulletins				
A: 0335 0935 1535	Weather messages for shipping.			
Navigational Warnings				
B: 0335 0935 1535	Navigational Warnings.			

MEXICO (Pacific Coast)

ENSENADA (XFE)				
Control Centre: 31°50′·23N 116°35′·93W				
A	Ch 25	VHF		
B	Ch 26			
Diagram page 190				
Weather Bulletins				
A: 0335 0935 1535	Weather messages for shipping.			
Navigational Warnings				
B: 0335 0935 1535	Navigational Warnings.			

LÁZARO CÁRDENAS				
Control Centre: 17°57′·70N 102°11′·80W				
A	Ch 27	VHF		
B	Ch 26			
Diagram page 190				
Weather Bulletins				
A: 0335 0935 1535	Weather messages for shipping.			
Navigational Warnings				
B: 0335 0935 1535	Navigational Warnings.			

MANZANILLO (XFM)				
Control Centre: 19°01′·20N 104°20′·00W				
A	Ch 25	VHF		
B	Ch 26			
Diagram page 190				
Weather Bulletins				
A: 0335 0935 1535	Weather messages for shipping.			
Navigational Warnings				
B: 0335 0935 1535	Navigational Warnings.			

MAZATLÁN (XFL)				
Control Centre: 23°11′·36N 106°25′·51W				
A	8514	RT (HF)		
B	Ch 25	VHF		
C	Ch 26			
Diagram page 190				
Weather Bulletins				
B: 0335 0935 1535	Weather messages for shipping.			
Navigational Warnings				
A, C: 0335 0935 1535	Navigational Warnings.			

PUERTO VALLARTA				
Control Centre: 20°46′·92N 105°31′·48W				
A	Ch 27	VHF		
B	Ch 26			
Diagram page 190				
Weather Bulletins				
A: 0335 0935 1535	Weather messages for shipping.			
Navigational Warnings				
B: 0335 0935 1535	Navigational Warnings.			

NEW CALEDONIA (France)

GENERAL NOTES

TELEPHONE

+687 366736:

Bulletin general: Meteorological forecasts (24/36h) of the situation over the entire territory (winds and temperatures) and possibly observations of tropical phenomenon.

Bulletin du lagon: General situation, 24h forecast of weather, swell and wind. Tide times and notice of tropical phenomenon.

Bulletin du large: General situation, 24h forecast, cloud cover, visibility, wind, sea state and swell; notice of tropical phenomenon.

2622:

METEOMAG: Broadcast service for meteorological information by SMS which enables you to find the forecast for your region. For example, for Nouméa: send PREV NOU to 2622.

+687 366808:

Fax server providing various products (isobar charts, meteorological bulletins, satellite photos etc.). Dial 366808 then the three digits for the product you require (to get a summary of the products enter the code 000).

INTERNET WEATHER SERVICES

New Caledonian Meteorological Service www.meteo.nc	Select 'Mer' from the main menu and then either 'Bulletin lagon' or 'Bulletin marine' for coastal or high seas forecasts, in French only.

MARITIME SAFETY INFORMATION (MSI) ON THE INTERNET

The internet is not part of the Maritime Safety Information system and should never be relied upon as the only means to obtain the latest forecast and warning information. Access to the service may be interrupted or delayed from time to time, updates may also be delayed. Please refer to GMDSS services, INMARSAT SafetyNET or international NAVTEX for the latest information. However, the following website(s) may prove useful to the mariner:

www.mrcc.nc/information-nautique	Nouméa MRCC website	Navigation Warnings and associated information in French.

NOUMÉA MRCC

Control Centre: 22°17′·00S 166°26′·00E

A	Ch 66	VHF	Bourail	21°27′·25S 165°22′·08E
			Poro	21°18′·92S 165°45′·54E
			Yate[1]	22°03′·50S 166°53′·53E
B			Nouméa	22°15′·69S 166°27′·03E
			Ouvéa	20°39′·12S 166°32′·08E
			Voh (Kafeate)	21°02′·08S 164°43′·29E
C			Canala	21°29′·34S 165°52′·36E
			La Roche Maré	21°28′·40S 168°02′·09E
			Pouebo (Mandjelia)	20°24′·11S 164°31′·48E
			Prony (Oungone)	22°19′·05S 166°55′·31E
D			Belep	19°44′·92S 163°40′·63E
			Lifou	21°05′·68S 167°23′·38E
			Touho	20°47′·85S 165°13′·73E
E			Boulouparis (Mont Do)	21°45′·24S 165°59′·99E
			Ile des Pins	22°39′·82S 167°26′·39E
			Koumac	20°27′·57S 164°12′·90E
			Tadine Maré	21°34′·45S 167°53′·20E
F	Ch 65		Boulouparis (Mont Do)	21°45′·24S 165°59′·99E
			Ile des Pins	22°39′·82S 167°26′·39E
			Koumac	20°27′·57S 164°12′·90E
			Tadine Maré	21°34′·45S 167°53′·20E
G			Bourail	21°27′·25S 165°22′·08E
			Poro	21°18′·92S 165°45′·54E
			Yate[1]	22°03′·50S 166°53′·53E
H			Nouméa	22°15′·69S 166°27′·03E

Continued on page 195


V3i2WNCL V004 28/10/10
DRAFT
DRAFT
0°
160°
170°
180°
0°
10°
10°
20°
20°
30°
30°
SOLOMON ISLANDS
Santa Cruz Is
Banks Is
ZONE LARGE
VANUATU
FIJI
Chesterfield Reefs
NEW CALEDONIA (France)
Norfolk I
NEW CALEDONIA (France)
FORECAST AREA

NEW CALEDONIA (France)

NOUMÉA MRCC (Continued)

H	Ch 65	VHF	Ouvéa	20°39′·12S 166°32′·08E
			Voh (Kafeate)	21°02′·08S 164°43′·29E
I			Canala	21°29′·34S 165°52′·36E
			La Roche Maré	21°28′·40S 168°02′·09E
			Pouebo (Mandjelia)	20°24′·11S 164°31′·48E
			Prony (Oungone)	22°19′·05S 166°55′·31E
J			Belep	19°44′·92S 163°40′·63E
			Lifou	21°05′·68S 167°23′·38E
			Touho	20°47′·85S 165°13′·73E

Diagram page 194

Weather Bulletins

A: H+00 **B:** H+12 **C:** H+24 **D:** H+36 **E:** H+48	Weather bulletins and BMS for each of the lagoon areas of New Caledonia, are broadcast once every hour in the listed sequence, in French.
F[2]**:** H+00 **G**[2]**:** H+12 **H**[2]**:** H+24 **I**[2]**:** H+36 **J**[2]**:** H+48	Weather bulletins and BMS for the offshore sea areas around New Caledonia in French. Broadcasts are only made during the following timeslots, at the stated intervals for each transmission area: 0600–0700, 1100–1200, 1600–1700 and 2100–2200 LT.

Navigational Warnings

F[2]**:** H+00 **G**[2]**:** H+12 **H**[2]**:** H+24 **I**[2]**:** H+36 **J**[2]**:** H+48	Navigational warnings for the offshore sea areas around New Caledonia in French. Broadcasts are only made during the following timeslots, at the stated intervals for each transmission area: 0600–0700, 1100–1200, 1600–1700 and 2100–2200 LT.

[1] Temporarily inoperative.
[2] After prior announcement on VHF Ch 16.

RADIO DJIIDO

Control Centre: 22°15′·52S 166°26′·77E

	97 MHz	FM	Aoupinié	21°11′·00S 165°16′·00E
	96 MHz		Bélep	19°42′·00S 163°39′·00E
	103 MHz		Bourail	21°36′·00S 165°29′·00E
	102 MHz		Canala	21°43′·00S 165°50′·00E
			Dumbéa	22°09′·00S 166°27′·00E
			Hienghéne	20°42′·21S 164°57′·75E
	103 MHz		Houailou	21°16′·37S 165°36′·89E
	102 MHz		Koné	21°03′·00S 164°52′·00E
	103 MHz		Koumac	20°32′·61S 164°15′·57E
	98·5 MHz		Lifou	21°06′·00S 167°24′·00E
	97·5 MHz		Maré	21°33′·00S 167°53′·00E
	97·4 MHz		Nouméa	22°17′·00S 166°27′·00E
	96 MHz		Ouaco	20°50′·00S 164°28′·00E
	96·5 MHz		Ouvéa	20°39′·00S 166°33′·00E
	102 MHz		Poum	20°16′·00S 164°02′·00E
	103 MHz		Thio	21°37′·00S 166°13′·00E
	97 MHz		Vao	22°39′·00S 167°29′·00E

Diagram page 194

Continued overleaf

NEW CALEDONIA (France)

RADIO DJIIDO (Continued)

Weather Bulletins	
On receipt	Cyclone warnings.
0515 LT (Mon-Fri)	Marine bulletin.
0815 LT	Weather forecast.

RADIO NOUVELLE-CALÉDONIE (RADIO FRANCE OUTREMER)

Control Centre: 22°16′·78S 166°26′·80E

	666 kHz	AM		
	88-91·5 MHz	FM		

Diagram page 194

Weather Bulletins	
On receipt	Cyclone warnings.
0700 0900 1100 2000 2200 LT	Storm warnings for zone “large” 300 n miles from the coasts of New Caledonia and Vanuatu. Meteorological bulletins “public”, “lagon” and “marine”.

RADIO NRJ

Control Centre: 22°16′·69S 166°26′·80E

	93·5 MHz	FM		

Diagram page 194

Weather Bulletins	
0530 0830 1230 LT	Meteorological bulletin du lagon.
0610 0710 1710 LT	Meteorological bulletin “general”.

RADIO OCÉANE

Control Centre: 22°16′·69S 166°26′·80E

	95 MHz	FM	Nouméa	

Diagram page 194

Weather Bulletins	
1745 LT	Cyclone warnings and meteorological bulletin “general”.

RADIO RYTHME BLEU

Control Centre: 22°16′·13S 166°26′·54E

	102·5 MHz	FM	Lifou	20°58′·00S 167°14′·00E
	101·5 MHz		Maré	21°32′·45S 167°53′·43E
	103·5 MHz		Ouvéa	20°39′·12S 166°32′·09E
	98 MHz 99 MHz 100 MHz		Rest of territory	
	100·4 MHz		South of Grande Terre	

Diagram page 194

Weather Bulletins	
0630 1800 LT	Cyclone warnings and meteorological bulletins “lagon”, “general” and “large”.

NEW ZEALAND

INTERNET WEATHER SERVICES

New Zealand MetService www.metservice.com	Coastal and high seas forecasts, gale warnings and associated marine weather data.

MARITIME SAFETY INFORMATION (MSI) ON THE INTERNET

The internet is not part of the Maritime Safety Information system and should never be relied upon as the only means to obtain the latest forecast and warning information. Access to the service may be interrupted or delayed from time to time, updates may also be delayed. Please refer to GMDSS services, INMARSAT SafetyNET or international NAVTEX for the latest information. However, the following website(s) may prove useful to the mariner:

www.maritimenz.govt.nz/navarea	Maritime New Zealand (RCCNZ)	Navigation Warnings for New Zealand coastal waters, as well as NAVAREA XIV, in English.
www.linz.govt.nz/sea/maritime-safety	Land Information New Zealand (LINZ)	Notices to Mariners and associated information, in English.

FIRING PRACTICE AREAS - GENERAL INFORMATION

Firing practice areas in New Zealand operate using a 'clear range' policy, with the responsibility lying with the relevant authority to ensure that vessels are not put in danger. Furthermore, in addition to the scheduled broadcasts containing firing practice warnings, all firings in the New Zealand area (whether in prescribed areas or not), are announced on VHF Ch 16 and 2182 kHz RT (MF) 5 minutes prior to commencement of live firing, every 30 minutes thereafter and immediately on completion of firing. The announcements will begin in the form *'I am about to commence gunnery practice' or 'I have completed gunnery practice'*.

FIRING PRACTICE AREA - ROCKET LAB LAUNCH COMPLEX

Approximate Position: 39°16′·00S 177°52′·00E

Based on the Mahia Peninsula of North Island, the complex carries out satellite launches and rocket testing. Mariners should be aware of hazardous launch areas and space debris zones, which are advertised by NZ Notice to Mariners. Rocket Lab Range Control can be contacted during launch operations on VHF Ch 07 in the vicinity of the Mahia Peninsula. Further information and e-mail enquiry form, can be found on their website at https://www.rocketlabusa.com.

METSERVICE

Diagram page 198

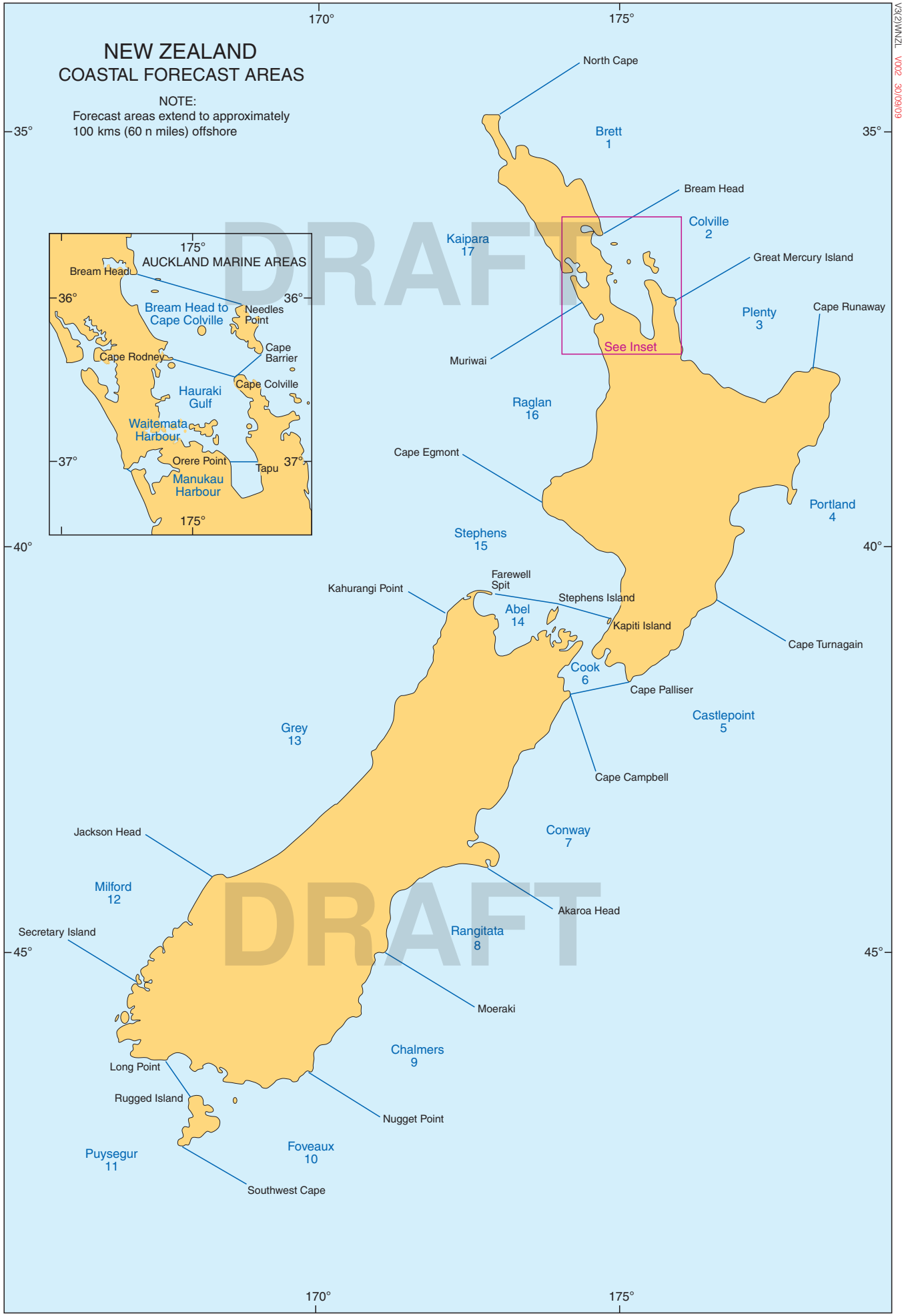
MetPhone – Telephone marine weather information service

Coastal forecasts are available H24 for all areas including the Chatham Islands, through MetPhone. All forecasts are constantly monitored and updated 24 hours a day. This service is chargeable.

To use MetPhone dial 0900 999 + the area code.

Coastal Area	Area Code
Brett	60
Colville	61
Plenty	62
Portland	63
Castlepoint	64
Cook	65
Abel	66
Conway	67
Rangitata	68

Coastal Area	Area Code
Chalmers	69
Foveaux	70
Puysegur	71
Milford	72
Grey	73
Stephens	74
Raglan	75
Kaipara	76
Chatham Islands	78



NEW ZEALAND

TSUNAMI WARNING SYSTEM

Diagram page 200

Background

A *tsunami* is a series of waves resulting from undersea earthquakes, volcanic eruptions or landslides and those originating in any part of the Pacific may have serious effects upon shipping in New Zealand's waters.

The attention of mariners is drawn to the "Tsunamis" section of the ADMIRALTY publication The Mariner's Handbook (NP100).

Should a strong earthquake be felt whilst a vessel is at her berth the vessel should immediately have her engines placed on standby, be secured for sea and only essential personnel given access to the gangways. These steps should be taken whilst awaiting further instructions.

Tsunami Warning System

These procedures have been formalised with Maritime New Zealand, Ministry of Civil Defence and Emergency Management (MCDEM), Police, Shipowners, Port Authorities, Regional Councils and Harbour Masters.

Inter-agency Communication

In the event of the potential threat of a tsunami approaching New Zealand, MCDEM will advise:

(a) each regional Civil Defence Emergency Management Group (CDEMG)

(b) Rescue Coordination Centre (RCCNZ).

Note: For tsunami originating near New Zealand ('local source' tsunami) timely advice by MCDEM may not be possible.

Each Regional CDEMG via Regional Council and Harbour Masters / Port Authorities will inform the mariner as quickly as possible. Port Authorities would likely take their own precautions as per their Emergency Operating Procedures. RCCNZ via Maritime Radio may provide Coastal Navigational Warnings.

Instructions to Vessels Inshore - Local Navigational Warnings

Warning Types

(a) Verbal
Vessels will be advised verbally by the Harbour Master.

(b) Sound signal
The signal to be given to warn vessels in harbour to take action is a series of five prolonged blasts. In some ports this signal will be made by sirens (on instructions from the CDEMG), which will be situated in positions from which the signal may be heard at all points in the harbours.

Following this signal Harbour Masters will take full control of all shipping operations in their area and Masters are asked to give their unreserved cooperation.

Warning Type by Port

Verbal Signal		Sound Signal
Auckland	Onehunga	Chatham Islands
Akaroa	Opua (Bay of Islands)	
Bluff	Picton	
Chatham Islands	Port Chalmers	
Dunedin	Port Taranaki	
Gisborne	Tarakohe Harbour (Port Golden Bay)	
Greymouth	Tauranga	
Kaikoura	Timaru	
Lyttelton	Wanganui	
Marsden Point	Wellington	
Napier	Westport	
Nelson	Whakatane	

Keeping Radio Watch following the Warning

On arrival in port, Masters will be advised by the Harbour Master as to which frequency is to be guarded in the event of an alert. On hearing these warnings, Masters are to set radio watches (where ever possible both RT and VHF, if fitted are to be guarded). These watches are to be maintained until the threat is is declared over by the same authority that issued the original advice. All further instructions will be passed by radio. The following table shows VHF Channels available to vessels.

VHF Channels to Guard by Port

Port	Call Sign	VHF Channels Call 16, then (main channel in bold)
Akaroa	Akaroa Harbour Control	06 (not H24)
Auckland	Auckland Harbour Control	**12**
Bay of Islands	Russell Radio	63
Bluff	Bluff Harbour Radio	12, 14

Continued on page 201


NEW ZEALAND
PORT RADIO STATIONS
TSUNAMI WARNING SYSTEM
NOTES:
(1) Broadcasts are announced through VHF Ch 16
(2) On arrival in port, Masters will be advised by the Harbour Master which frequency is to be guarded in the event of an alert
DRAFT
DRAFT
165°
170°
175°
180°
35°
40°
45°
Russell Radio
Whangarei Harbour Radio
Auckland Harbour Control
Tauranga Port Radio
Gisborne Harbour Radio
New Plymouth Harbour Radio
Napier Harbour Radio
Wanganui Harbour Radio
Picton Harbour Radio
Nelson Harbour Radio
Wellington Harbour Radio
Westport Harbour Radio
Greymouth Harbour Radio
Lyttelton Harbour Radio
Timaru Harbour Radio
Otago Harbour Control
Bluff Harbour Radio
V3(2)TSUNAMINZ V007 30/07/15

NEW ZEALAND

Tsunami Warning System (Continued)

Port	Call Sign	VHF Channels Call 16, then (main channel in bold)
Dunedin	Otago Harbour Control	12, 14, 62
Gisborne	Gisborne Harbour Radio	12
Greymouth	Greymouth Harbour Radio	06, 14, **63** (not H24)
Kaikoura	Kaikoura Harbour Control	16 and as directed (not H24)
Lyttelton	Lyttelton Harbour Radio	12, 63
Marsden Point	Whangarei Harbour Radio	11
Napier	Napier Harbour Radio	12
Nelson	Nelson Harbour Radio	12
Onehunga	Auckland Harbour Control	12
Picton	Picton Harbour Radio	18
Port Chalmers	Otago Harbour Control	12, 14, 62
Port Taranaki	New Plymouth Harbour Radio	12, 61
Tauranga	Tauranga Port Radio	12
Timaru	Timaru Harbour Radio	09
Wanganui	Wanganui Harbour Radio ZMH211	16 only
Wellington	Wellington Harbour Radio	14
Westport	Westport Harbour Radio ZMH92	14

Ordering Vessels to Sea

In certain cases it may be necessary for the Harbour Master to order vessels to sea to avoid serious damage being caused to vessels and harbour structures by strong wave action in their harbours.

Mariners are to advise Harbour Masters whenever it is intended to carry out engine maintenance which will immobilise their vessels.

It should be appreciated that the time available for action after receiving the alert signal may be as long as 14 hours or as brief as minutes, depending on the origin of the tsunami.

Instructions to Vessels at Sea - Coastal Navigational Warnings

In the case of vessels at sea, when a warning of an approaching tsunami is received, advice will be given by the existing navigational warning system.

These warnings may include instructions for vessels' immediate movements. It should be noted that the risk of tsunami for vessels at sea is much less (in most cases none) than inshore or in harbour.

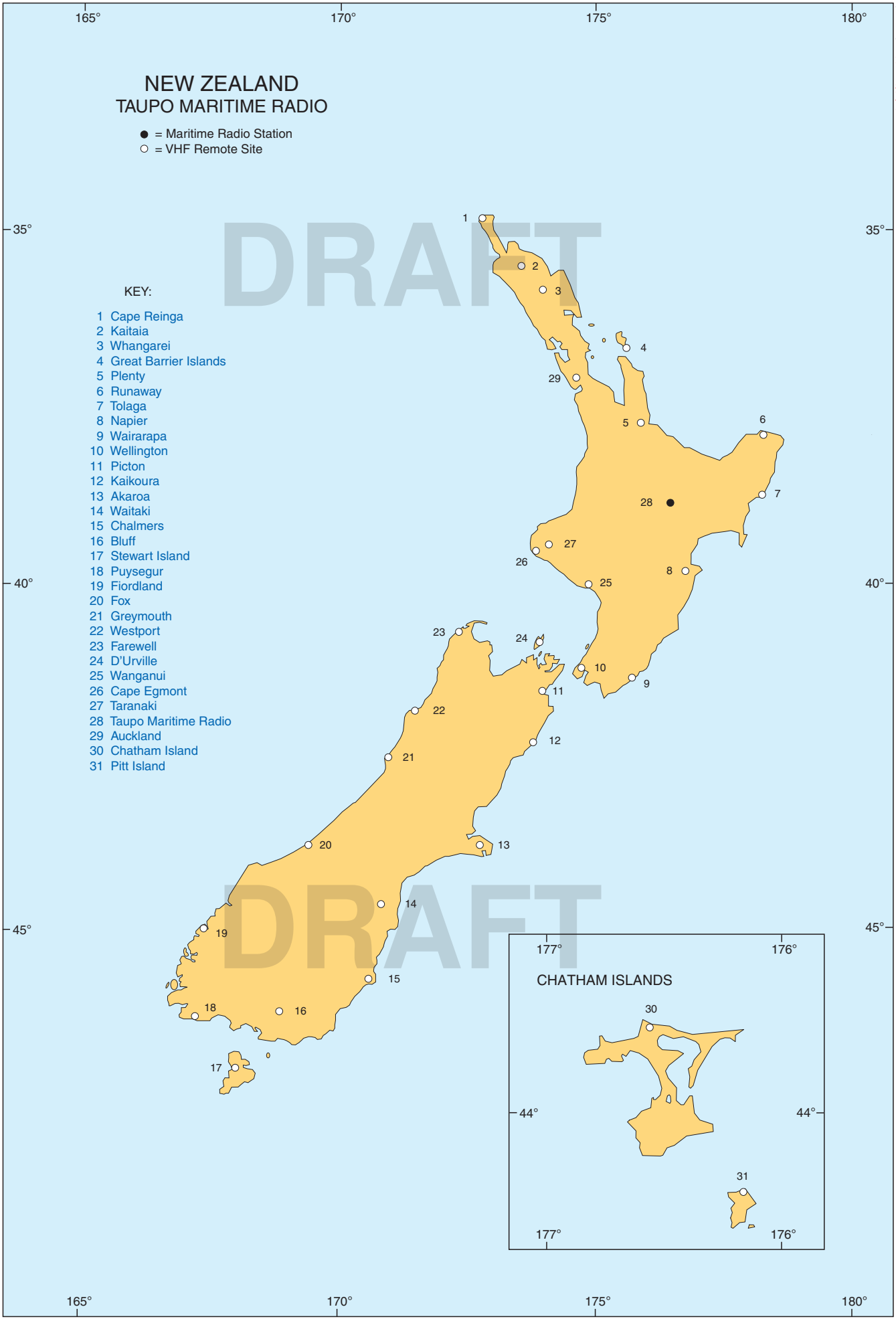
Request to all Vessels to Provide Assistance

Should a disaster occur ashore, all vessels in port and at sea in New Zealand waters may be called upon to provide assistance at the request of the authorities. Harbour Masters will arrange with Masters what assistance each vessel in port is able to provide. Vessels at sea will be contacted by the normal communications system.

For further information see: www.civildefence.govt.nz (Title Search - Tsunami Advisory Warning)

TAUPO MARITIME RADIO (ZLM)				
Control Centre: 38°52′·16S 176°26′·13E				
A	2207	RT (MF)		
B	4146	RT (HF)		
C	6224			
D	8297			
E	12356			
F	16531			
G	Ch 68	VHF	Akaroa	43°43′·00S 172°57′·00E
	Ch 71		Auckland	36°56′·00S 174°34′·00E
	Ch 68		Bluff	46°06′·00S 168°38′·00E
	Ch 71		Cape Egmont	39°18′·00S 173°59′·00E
	Ch 68		Cape Reinga	34°28′·00S 172°46′·00E

Continued on page 203


NEW ZEALAND
TAUPO MARITIME RADIO
● = Maritime Radio Station
○ = VHF Remote Site
DRAFT
KEY:
1 Cape Reinga
2 Kaitaia
3 Whangarei
4 Great Barrier Islands
5 Plenty
6 Runaway
7 Tolaga
8 Napier
9 Wairarapa
10 Wellington
11 Picton
12 Kaikoura
13 Akaroa
14 Waitaki
15 Chalmers
16 Bluff
17 Stewart Island
18 Puysegur
19 Fiordland
20 Fox
21 Greymouth
22 Westport
23 Farewell
24 D'Urville
25 Wanganui
26 Cape Egmont
27 Taranaki
28 Taupo Maritime Radio
29 Auckland
30 Chatham Island
31 Pitt Island
165°
170°
175°
180°
35°
40°
45°
CHATHAM ISLANDS
177°
176°
44°
GENERIC V002 25/01/18

NEW ZEALAND

TAUPO MARITIME RADIO (ZLM) (Continued)

G	Ch 71	VHF	Chalmers	45°48′·80S 170°33′·42E
	Ch 67		D'Urville	40°51′·00S 173°52′·00E
	Ch 68		Farewell	40°38′·00S 172°38′·00E
	Ch 71		Fiordland	44°54′·00S 167°20′·00E
	Ch 67		Fox	43°36′·00S 169°46′·00E
	Ch 69		Great Barrier Islands	36°20′·00S 175°31′·00E
	Ch 68		Greymouth	42°23′·94S 171°20′·74E
	Ch 67		Kaikoura	42°12′·17S 173°47′·40E
	Ch 71		Kaitaia	35°10′·00S 173°31′·00E
	Ch 68		Napier	39°45′·00S 176°51′·00E
			Picton	41°15′·95S 174°07′·05E
			Plenty	37°32′·00S 175°45′·00E
	Ch 67		Puysegur	46°08′·00S 166°49′·00E
	Ch 71		Runaway	37°33′·00S 177°59′·51E
			Stewart Island	46°56′·00S 167°52′·00E
	Ch 67		Taranaki	39°13′·07S 173°58′·56E
			Tolaga	38°34′·00S 178°07′·00E
			Wairarapa	41°19′·00S 175°46′·00E
			Waitaki	44°38′·00S 170°54′·00E
	Ch 69		Wanganui	39°49′·00S 174°56′·00E
	Ch 71		Wellington	41°14′·02S 174°46′·79E
			Westport	41°46′·71S 171°44′·25E
	Ch 67		Whangarei	35°32′·00S 174°05′·00E
H	Ch 60		Chatham Island	43°43′·00S 176°35′·00W
	Ch 62		Pitt Island	44°14′·70S 176°13′·90W

Diagrams pages 198 and 202

Weather Bulletins

A-C: 0133 0533 1333 1733 LT **G[1]:** 0133 0533 0733 1033 1333 1733 2133 LT	Weather synopsis and forecasts for all New Zealand sea areas.
C[2], E[2]: 0303 1503 LT **D[2], F[2]:** 0333 1533 LT	Weather synopsis and forecasts for High Seas Area Southern.
C[2], E[2]: 0903 2103 LT **D[2], F[2]:** 1003 2203 LT	Weather synopsis and forecasts for High Seas Areas Subtropic, Forties, Pacific and Islands.
A-C: 0133 0533 0803 1203 1333 1733 2003 LT **G[1]:** 0133 0533 0733 1033 1333 1733 2133 LT	Coastal reports for shipping.
H[3]: 0603 1403 1803 2203 LT	Weather synopsis and forecasts for Chatham Islands.

Navigational Warnings

A-C: 0133 0533 1333 1733 LT **G[1]:** 0133 0533 0733 1033 1333 1733 2133 LT	Meteorological and Navigational Warnings all for New Zealand sea areas.

Continued overleaf

NEW ZEALAND

TAUPO MARITIME RADIO (ZLM) (Continued)

C[2], E[2]: 0303 0903 1503 2103 LT **D[2], F[2]:** 0333 1003 1533 2203 LT	Meteorological and Navigational Warnings in force for Navarea XIV.
H[3]: 0603 1403 1803 2203 LT	Meteorological and Navigational Warnings for Chatham Islands.
[1] 1033 broadcasts are Coastal Reports which include Meterorological Warnings in force at time of broadcast for any additional coastal areas, if applicable. [2] Broadcasts made 1 hour later when NZDT is in force (see ALRS Volume 2 (NP282) for dates). [3] Chatham Islands local time is 45 minutes ahead of NZST.	
NOTE(S): Maritime Safety Information will be announced prior to broadcast on VHF Ch 16, 2182 kHz, 4125 kHz and 6215 kHz as applicable.	

NICARAGUA

INTERNET WEATHER SERVICES

Nicaraguan Meteorological Institution www.ineter.gob.ni/pronosticomaritimo.html	Maritime weather forecasts for Caribbean and Pacific coasts.

PANAMA

INTERNET WEATHER SERVICES

Panamanian Hydrometeorological Department www.hidromet.com.pa/condiciones_maritimas.php	Marine weather bulletins and warnings, together with tide times, weather radar/satellite imagery and astronomical information, in English.

PAPUA NEW GUINEA

PORT MORESBY (P2M)

Control Centre: 9°28′·25S 147°10′·74E

	4405 *(Ch 417)* 6510 *(Ch 604)*	RT (HF)		
Weather Bulletins				
0003 0603	24 hour forecast for coastal waters of Papua New Guinea, New Britain, Bougainville and Bismarck Archipelago.			
Navigational Warnings				
On receipt	Storm warnings and urgent Navigational Warnings for 0°–12°S, 141°E–160°E.			
Every even H+03	Gale warnings for 0°–12°S, 141°E–160°E.			
At the next even H+03	Urgent Navigational Warnings for 0°–12°S, 141°E–160°E.			
0003 0603	Gale warnings for coastal waters of Papua New Guinea, New Britain, Bougainville and Bismarck Archipelago.			
0603 2203	Navigational Warnings for 0°–12°S, 141°E–160°E.			

NOTE(S): Broadcasts operational 2100–1200

PERU

NAVTEX

U	Callao	518 kHz	12°04′·34S 77°10′·13W
W	Mollendo (Matarani)		17°00′·60S 72°02′·10W
S	Paita		5°05′·54S 81°07′·41W
Diagrams pages 40 and 206			
Weather Bulletins			
U: 0720 1920	Forecast and sea state for Sea Areas I–IV.		
W: 1140 2340	Forecast and sea state for Sea Area III.		
S: 0300 1500	Forecast and sea state for Sea Area I.		

Continued on next page

PERU

NAVTEX (Continued)

Navigational Warnings	
U: 0320 1120 1520 2320	Navigational Warnings.
W: 0340 0740 1540 1940	
S: 0700 1100 1900 2300	
NOTE: Temporarily inoperative.	

MARITIME SAFETY INFORMATION (MSI) ON THE INTERNET

The internet is not part of the Maritime Safety Information system and should never be relied upon as the only means to obtain the latest forecast and warning information. Access to the service may be interrupted or delayed from time to time, updates may also be delayed. Please refer to GMDSS services, INMARSAT SafetyNET or international NAVTEX for the latest information. However, the following website(s) may prove useful to the mariner:

www.dhn.mil.pe	Peruvian Hydrographic Office	Navigation Warnings in English and Spanish, weather bulletins and other associated information in Spanish only.

CALLAO MRCC (OBC3)

Control Centre: 12°04′·34S 77°10′·13W

	Ch 16	VHF		
Diagram page 206				
Navigational Warnings				
On receipt	Special weather warnings.			

CHIMBOTE (OBZ3)

Control Centre: 9°04′·82S 78°37′·43W

	Ch 16	VHF		
Diagram page 206				
Navigational Warnings				
On receipt	Special weather warnings.			

HUACHO

Control Centre: 11°06′·30S 77°37′·02W

	Ch 16	VHF		
Diagram page 206				
Navigational Warnings				
On receipt	Special weather warnings.			

ILO MRSC

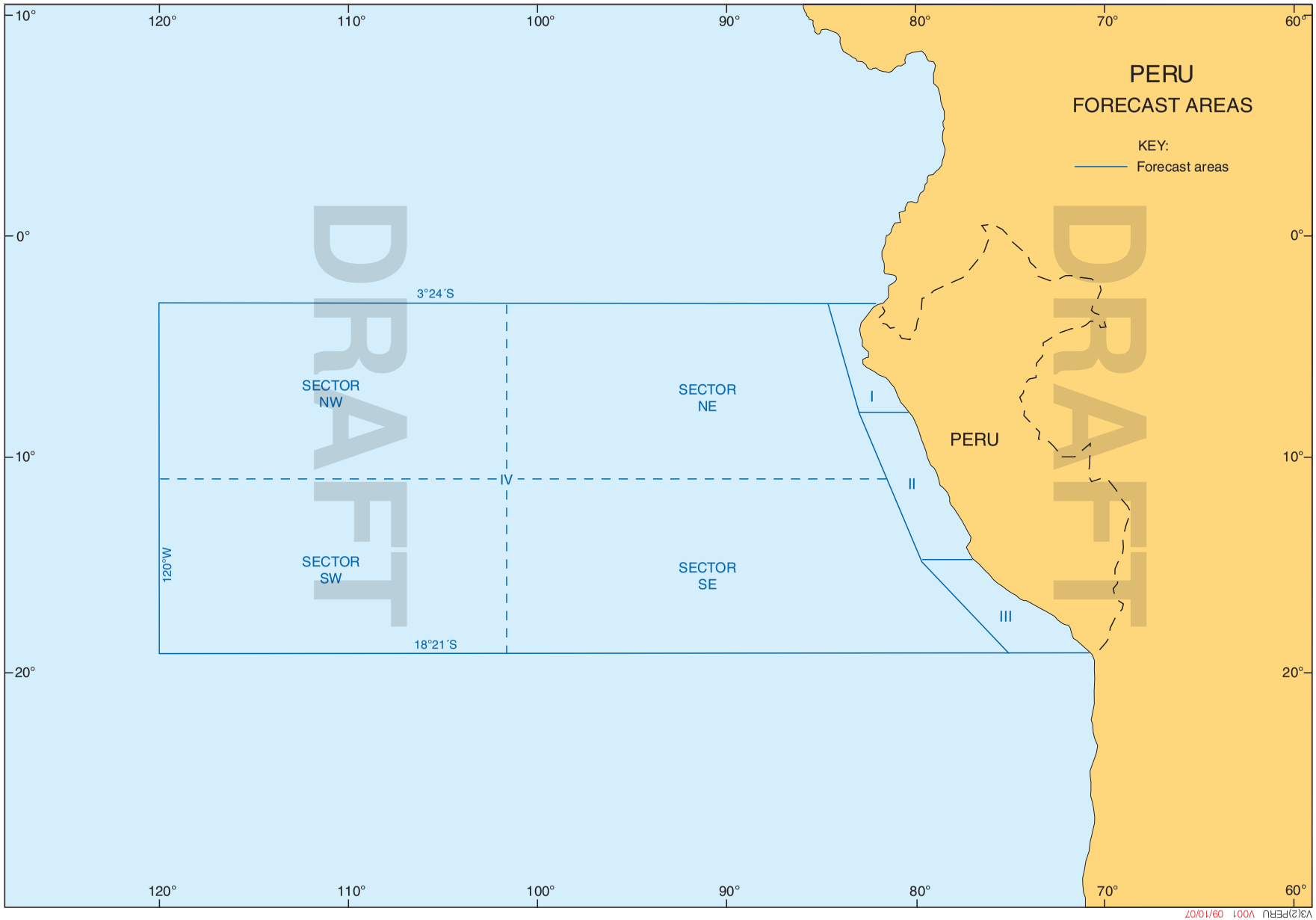
Control Centre: 17°38′·81S 71°20′·28W

	Ch 16	VHF		
Diagram page 206				
Navigational Warnings				
On receipt	Special weather warnings.			

MOLLENDO MRSC (OBF4)

Control Centre: 17°00′·60S 72°02′·10W

	Ch 16	VHF		
Diagram page 206				
Navigational Warnings				
On receipt	Special weather warnings.			


PERU
FORECAST AREAS
KEY:
Forecast areas
10°
120°
110°
100°
90°
80°
70°
60°
0°
20°
3°24´S
18°21´S
120°W
SECTOR NW
SECTOR NE
SECTOR SW
SECTOR SE
IV
I
II
III
PERU
DRAFT
V3(2)PERU V001 09/10/07

PERU

PAITA MRSC (OBY2)

Control Centre: 5°05′·29S 81°06′·39W

	Ch 12 16	VHF		
Diagram page 206				
Navigational Warnings				
On receipt	Special weather warnings.			

PIMENTEL (OBH2)

Control Centre: 6°56′·70S 79°51′·51W

	Ch 16	VHF		
Diagram page 206				
Navigational Warnings				
On receipt	Special weather warnings.			

PISCO MRSC

Control Centre: 13°43′·00S 76°13′·00W

	Ch 16	VHF		
Diagram page 206				
Navigational Warnings				
On receipt	Special weather warnings.			

SALAVERRY MRSC (OBR3)

Control Centre: 8°13′·42S 78°58′·85W

	Ch 16	VHF		
Diagram page 206				
Navigational Warnings				
On receipt	Special weather warnings.			

TALARA (OBT2)

Control Centre: 4°35′·00S 81°17′·00W

	Ch 16	VHF		
Diagram page 206				
Navigational Warnings				
On receipt	Special weather warnings.			

ZORRITOS MRSC (OBU2)

Control Centre: 3°40′·17S 80°39′·54W

	Ch 16	VHF		
Diagram page 206				
Navigational Warnings				
On receipt	Special weather warnings.			

PHILIPPINES

INTERNET WEATHER SERVICES

Philippine Atmospheric, Geophysical & Astronomical Services Administration www.pagasa.dost.gov.ph	Shipping synopsis and forecast in English.

NAVTEX

J	Manila	518 kHz	14°30′·33N 121°03′·90E
Diagrams pages 37 and 209			

Continued overleaf

PHILIPPINES

NAVTEX (Continued)

Weather Bulletins	
J: 0130 0530 0930 1330 1730 2130	Weather bulletins.
Navigational Warnings	
J: 0130 0530 0930 1330 1730 2130	Navigational Warnings.
NOTE: Temporarily inoperative.	

MARITIME SAFETY INFORMATION (MSI) ON THE INTERNET

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www.namria.gov.ph/download.php	Philippines National Mapping and Resource Information Authority	Notices to Mariners in English.

MANILA (DZS4)

Control Centre: 14°35′·00N 120°59′·07E

A	8776·8	RT (HF)		
B	Ch 09 16 20	VHF		

Diagram page 209

Weather Bulletins	
A, B: 0030 0330 0630 0930 1230	24 hour forecast in English.
Navigational Warnings	
A, B: On receipt On request 0030 0330 0630 0930 1230	Storm warnings in English.
A: 0030 0330 0630 0930 1230	Navigational Warnings for Philippines coastal waters.

PUERTO RICO (USA)

INTERNET WEATHER SERVICES

National Weather Service www.srh.noaa.gov/sju	Maritime forecasts and warnings for coastal waters, in English and Spanish.

NAVTEX

R	Isabella	518 kHz	18°28′·00N 67°04′·32W

Diagrams pages 39 and 41

Weather Bulletins	
R: 0650 1050 1850 2250	Weather forecast.
Navigational Warnings	
R: 0250 0650 1050 1450 1850 2250	Weather and Navigational Warnings.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

For complete details of the NOAA's operations and services, please see the note under the United States of America Geographic Area.

SAN JUAN SECTOR & RSC (US COAST GUARD)

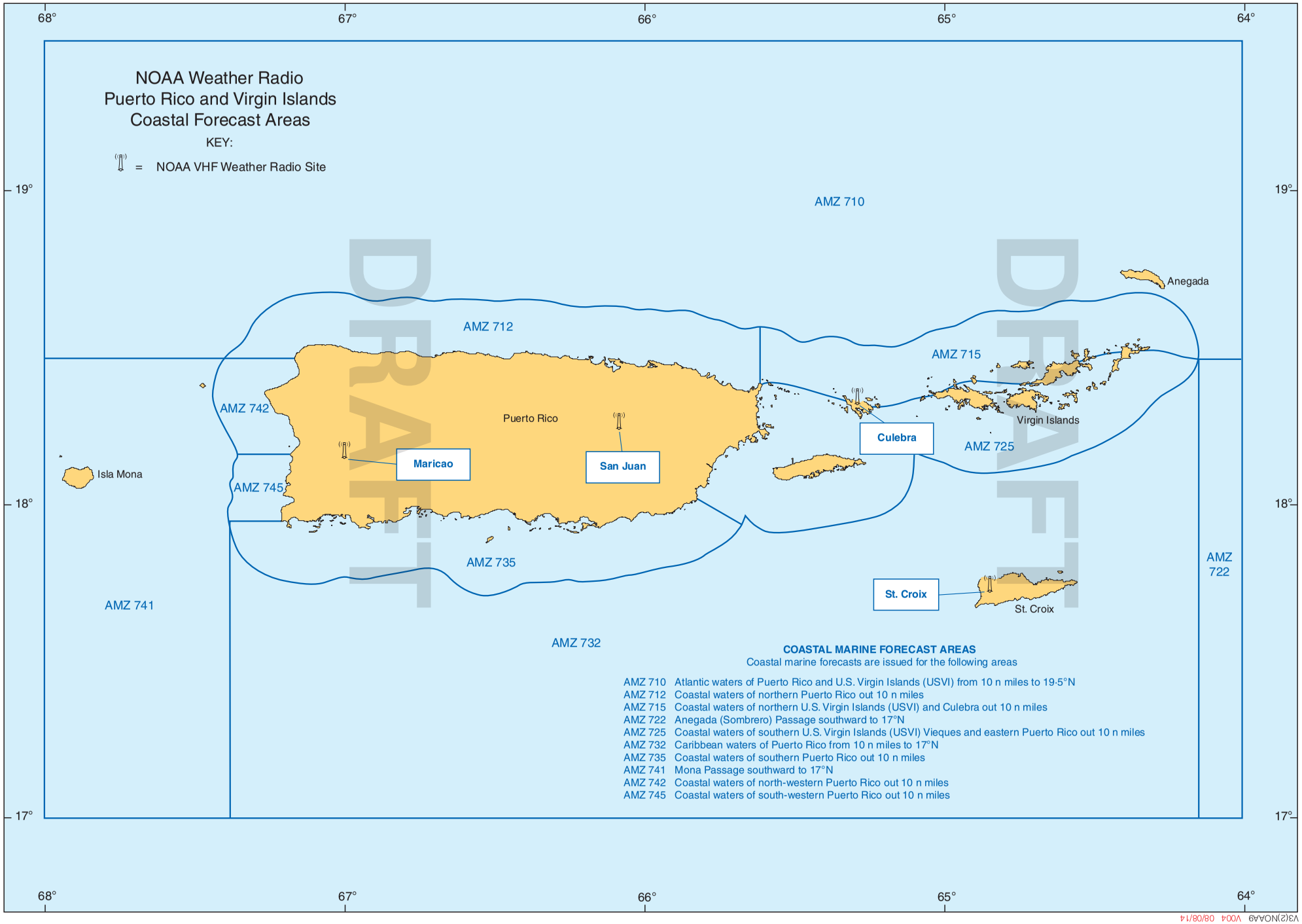
Control Centre: 18°27′·64N 66°06′·97W

	Ch 22A	VHF		18°27′·64N 66°06′·97W

Diagram page 210

Weather Bulletins	
1210 2210	Weather forecast and synopsis for E Caribbean E of 70°W, Puerto Rico, US Virgin Islands and adjacent waters out to 20 n miles.
Navigational Warnings	
On receipt 1210 2210	Storm and local Navigational Warnings.


V3(2)WPHL V.02 16/10/08
DRAFT
DRAFT
25°
115°
120°
125°
130°
135°
EAST TAIWAN
RYUKYU
BASHI
NORTH PHILIPPINE
20°
BALINTANG
SCARBOROUGH
15°
CENTRAL PHILIPPINE
MINDORO
INLAND
10°
MINDANAO
SULU
PALAWAN
SOUTH PHILIPPINE
MORO
5°
0°
PHILIPPINES
FORECAST AREAS
NOTE: INLAND area includes Sibuyan, Samar, Visayan and Camotes Seas
Indicates limit of Storm Warning area



COASTAL MARINE FORECAST AREAS

Coastal marine forecasts are issued for the following areas

AMZ 710	Atlantic waters of Puerto Rico and U.S. Virgin Islands (USVI) from 10 n miles to 19·5°N
AMZ 712	Coastal waters of northern Puerto Rico out 10 n miles
AMZ 715	Coastal waters of northern U.S. Virgin Islands (USVI) and Culebra out 10 n miles
AMZ 722	Anegada (Sombrero) Passage southward to 17°N
AMZ 725	Coastal waters of southern U.S. Virgin Islands (USVI) Vieques and eastern Puerto Rico out 10 n miles
AMZ 732	Caribbean waters of Puerto Rico from 10 n miles to 17°N
AMZ 735	Coastal waters of southern Puerto Rico out 10 n miles
AMZ 741	Mona Passage southward to 17°N
AMZ 742	Coastal waters of north-western Puerto Rico out 10 n miles
AMZ 745	Coastal waters of south-western Puerto Rico out 10 n miles

V3(2)NOAA9 V004 08/08/14

RUSSIA (Pacific Coast)

NAVTEX

B	Kholmsk	518 kHz	47°02′·00N 142°03′·00E
D	Magadan		59°41′·00N 150°09′·00E
G	Okhotsk		59°21′·50N 143°12′·50E
C	Petropavlovsk - Kamchatskiy		53°00′·00N 158°25′·40E
A	Vladivostok		43°23′·00N 131°55′·00E

Diagram page 38

Weather Bulletins

B: 0010 0410 0810 1210 1610 2010	Weather forecasts for Russian coastal waters including the central and southern Okhotskoye More and Tatarskiy Proliv.
D: 0030 0430 0830 1230 1630 2030	Weather synopsis and forecast for 12 hours for NE Okhotskoye More.
G: 0100 0500 0900 1300 1700 2100	Weather synopsis and forecast for 24 hours for NW Okhotskoye More.
C: 0020 0420 0820 1220 1620 2020	Weather synopsis and forecast for coastal waters of Kamchatka from Mys Utkholokskiy to Mys Kamchatskiy.
A: 0000 0400 0800 1200 1600 2000	Weather forecasts for Russian coastal waters including Zaliv Petra Velikogo and NW part of Sea of Japan.

Navigational Warnings

B: 0010 0410 0810 1210 1610 2010	Coastal and NAVAREA XIII warnings for Russian waters including central and southern Okhotskoye More and Tartarskiy Proliv.
D: 0030 0430 0830 1230 1630 2030	Storm and coastal warnings for NE Okhotskoye More.
G: 0100 0500 0900 1300 1700 2100	Storm and coastal warnings for NW Okhotskoye More.
C: 0020 0420 0820 1220 1620 2020	Coastal warnings for Kamchatka Coast from Mys Utkholokskiy to Mys Kamchatskiy.
A: 0000 0400 0800 1200 1600 2000	Coastal NAVAREA XIII warnings including Zaliv Petra Velikogo and NW part of Sea of Japan.

MARITIME SAFETY INFORMATION (MSI) ON THE INTERNET

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http://structure.mil.ru/structure/forces/hydrographic/info/navwar.htm	Ministry of Defence of the Russian Federation	Navigational Warnings in English.

BERINGOVSKIY

Control Centre: 63°07′·00N 179°12′·00E

	2525 3730	RT (MF)		

Diagram page 27

Weather Bulletins

Continuous broadcast	24 hour weather forecast for Port Beringovskiy and coastal waters out to 20 n miles from Anadyrskiy Liman to Bukhta Dezhneva in Russian.

NOTE(S): Station broadcasts only during navigation season (15 May to 1 Dec).

MAGADAN

Control Centre: 59°41′·00N 150°09′·00E

	2400	RT (MF)		

Diagram page 27

Weather Bulletins

0203 1233	Synopsis, weather and wave forecast for 24 hours and 48 hour weather forecast for NE part of Okhotskoye More in Russian.

Navigational Warnings

1303	Coastal warnings for NE part of Okhotskoye More and repeat of broadcast by Petropavlovsk-Kamchatskiy in Russian.

RUSSIA (Pacific Coast)

OKHOTSK

Control Centre: 59°21′·50N 143°12′·50E

	2560	RT (MF)		
Diagram page 27				

Weather Bulletins

0000	Synopsis for W part of Okhotskoye More and coastal waters out to 20 n miles from Zaliv Ayan to Poluostrov Lisyanskogo in Russian.
0550 1400 2200	24 hour weather and wave forecast and weather forecast for the following 48 hours for W part of Okhotskoye More and coastal waters out to 20 n miles from Zaliv Ayan to Poluostrov Lisyanskogo in Russian.

PETROPAVLOVSK-KAMCHATSKIY (UFH) [3737]

Control Centre: 53°14′·00N 158°25′·00E

A	4255	RADIO-TELEX		
B	4323			
C	6360·5			
D	6405			
E	8451			
F	12603			
G	12825			
H	17045			
Diagram page 27				

Weather Bulletins

A, D: 0900 2100 **G:** 2100	Summary and synopsis for 24 hours, weather forecast and sea state for 12 hours and forecast for next 24 hours for Penzhinskaya Guba, E part of Zaliv Shelikhova for coastal waters of Poluostrov Kamchatka and Komandorskiy Ostrova (in Okhotskoye More and Bering Sea).

Navigational Warnings

B, C: 0000 0700 **E, H:** 0000 **F:** 0700	List of numbers of coastal warnings in force in English.
A, D: 0900	NAVAREA XIII warnings in English.
A, D, G: 2100	NAVAREA XIII warnings and list of numbers of coastal warnings in force in English.

VLADIVOSTOK (UFL) [3714]

Control Centre: 43°23′·00N 131°55′·00E

A	3165 8595 12729	RADIO-TELEX		
B	17175·2			
Diagram page 27				

Weather Bulletins

A: 1100 2300	24 hour weather forecast for Okhotskoye More, Bering Sea, Sea of Japan N of 42° and NW Pacific Ocean from Kuril'skiye Ostrova to 180° to N of 45°N in English.
A: 1100	24 hour weather forecast for Russian coastal waters in the Sea of Japan in English.
A: 2300	12 hour weather forecast for Russian coastal waters in the Sea of Japan in English.
A: 1130	Synopsis, weather and wave forecast for 24 hours for Sea of Japan in Russian.
A, B: 2330	Synopsis, weather and wave forecast for 12 hours for Sea of Japan in Russian.

Continued on next page

RUSSIA (Pacific Coast)

VLADIVOSTOK (UFL) [3714] (Continued)

Navigational Warnings	
A: 1100 2300	Storm warnings for Okhotskoye More, Bering Sea, Sea of Japan N of 42° and NW Pacific Ocean from Kuril'skiye Ostrova to 180° to N of 45°N in English. Storm warnings for Russian coastal waters in the Sea of Japan in English. List of numbers of NAVAREA XIII warnings in force in English. NAVAREA XIII warnings in English. List of numbers of coastal warnings for NAVAREA XIII in force in English. Coastal warnings in English.
A: 1130	Storm warnings for Sea of Japan in Russian. List of numbers of coastal warnings for NAVAREA XIII in force in Russian. Repeat of broadcast by Vladivostok (UFZ) and Petropavlovsk-Kamchatskiy. Coastal warnings in Russian. Repeat of broadcast by Vladivostok (UFZ) and Petropavlovsk-Kamchatskiy. List of numbers of NAVAREA XIII warnings in force in Russian. List of numbers of current NAVAREA XIII and NAVIP warnings in Russian.
A, B: 2330	Storm warnings for Sea of Japan in Russian. List of numbers of coastal warnings for NAVAREA XIII in force in Russian. Repeat of broadcast by Vladivostok (UFZ) and Petropavlovsk-Kamchatskiy. Coastal warnings in Russian. Repeat of broadcast by Vladivostok (UFZ) and Petropavlovsk-Kamchatskiy. List of numbers of NAVAREA XIII warnings in force in Russian. NAVAREA XIII warnings in Russian.
A, B: 2330 (Sun)	List of numbers of current NAVAREA and NAVIP warnings in force for areas X-XII and XIV for the last 6 weeks in Russian.

VLADIVOSTOK 2 (UFZ)

Control Centre: 43°23′·00N 131°55′·00E

A	4241	RADIO-TELEX		
B	6314			
C	6460			
D	8416·5			
E	8643			
F	12579			
G	12799·5			
H	16806·5			
I	17155			

Diagram page 27

Weather Bulletins	
A, C, G, I: 2300	Synopsis for current 24 hour period, 24 hour weather forecast and sea state for Sea of Japan including Tsugaru Kaikyo in Russian.
A, C, E, G: 0900	Synopsis for current 24 hour period, 12 hour weather forecast and sea state for Sea of Japan including Tsugaru Kaikyo in Russian.
B, F, H: 0200	24 hour weather forecast for Russian coastal waters in the Sea of Japan in English.
B, D, F: 1100	12 hour weather forecast for Russian coastal waters in the Sea of Japan in English.
Navigational Warnings	
A, C, G: 0900 2300 **E:** 0900 **I:** 2300	Storm warnings for Sea of Japan including Tsugaru Kaikyo in Russian. Coastal warnings for Russian waters in the Sea of Japan, Tatarskiy Proliv, the SW part of Sea of Okhotsk to Zaliv Ayan; for the areas around Ostrov Sakhalin, including Proliv Laperuza and around the S part of Kurril'skiye Ostrova to the S tip of Ostrov Ketoy in Russian.
B, F: 0200 1100 **H:** 0200 **D:** 1100	Storm warnings for Sea of Japan N of 42°N and NW Pacific Ocean from Kuril'skiye Ostrova to meridian 180° and N of 45°N in English. Storm warnings for Russian coastal waters in the Sea of Japan in English. List of numbers of current NAVAREA XIII warnings, list of numbers of current coastal warnings for NAVAREA XIII English.

YUZHNO-SAKHALINSK (REGIONAL CENTRE) MRSC

Control Centre: 46°38′·00N 141°55′·00E

A	4030 6997	RT (HF)		
B	4480 5170	RT (HF)		

Diagram page 27

Continued overleaf

RUSSIA (Pacific Coast)

YUZHNO-SAKHALINSK (REGIONAL CENTRE) MRSC (Continued)

Weather Bulletins	
B: 0130 **A:** 1900	12 hour weather and wave forecast for W and SW parts of Okhotskoye More, Kuril'skiye Ostrova, Amurskiy Liman, Zaliv Aniva, Zaliv Sakhalinskiy, Zaliv Terpeniya, Proliv Laperuza and Proliv Tartarskiy (including coastal waters out to 20 n miles) in Russian.
B: 0630	24 hour weather and wave forecast and weather forecast for the following 48 hours for W and SW parts of Okhotskoye More, Kuril'skiye Ostrova, Amurskiy Liman, Zaliv Aniva, Zaliv Sakhalinskiy, Zaliv Terpeniya, Proliv Laperuza and Proliv Tartarskiy (including coastal waters out to 20 n miles) in Russian.

SAINT LUCIA

INTERNET WEATHER SERVICES

St. Lucia Meteorological Service www.slumet.gov.lc	Marine forecast for coastal areas up to 25 n miles offshore and tropical weather outlook, in English.

SAINT-PIERRE AND MIQUELON (France)

GENERAL NOTES

Diagram page 114

TELEPHONE

Meteo-France prepares bulletins for the coastal waters of Saint-Pierre and Miquelon out to 20 n miles (Zone Archipel). They are disseminated by RFO and telephone answering machine. Vessels may call directly by contacting the meteorological office at Saint-Pierre Airport.

0508 411870:

Meteorological bulletin updated 3 times a day.

General situation, 48 hour forecast including wind, sea state, storms, rain etc. for Sea Areas 213, 231 and 232 and for the Zone ARCHIPEL (see diagram).

0508 411868:

General meteorological bulletin.

INTERNET WEATHER SERVICES

Météo France Saint Pierre and Miquelon www.meteofrance.pm/marine.php	Maritime weather forecast, synopsis and tide times, in French.

MARITIME SAFETY INFORMATION (MSI) ON THE INTERNET

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www.saint-pierre-et-miquelon.developpement-durable.gouv.fr/avis-aux-navigateurs-anurnav-a28.html	DTAM Saint-Pierre et Miquelon	Navigation Warnings in French.

RADIO ATLANTIQUE

Control Centre: 46°47′·02N 56°10′·41W

	102·1 MHz	FM	Cap à l'Aigle / Saint-Pierre	
Weather Bulletins				
0757 0957 1157 1357 1557 1657 LT	Forecast for Newfoundland in French.			

SAINT-PIERRE-ET-MIQUELON PREMIERE (1ÈRE)

	99·9 MHz	FM	Cap à l'Aigle / Saint-Pierre	46°48′·00N 56°09′·00W
	98·9 MHz		Point au Cheval / Miquelon	47°01′·00N 56°22′·00W
Weather Bulletins				
0750 0850 1210 1245 1905 LT	Storm warnings, synopsis and 24 hour forecast for zone "Archipel", South and South West coasts of Newfoundland and Banquereau in French.			

SAMOA

INTERNET WEATHER SERVICES

Samoa Meteorology Division www.samet.gov.ws/index.php/sections/section1	Maritime coastal forecasts, weather warnings and synoptic charts.

SINGAPORE

INTERNET WEATHER SERVICES

Meteorological Service Singapore www.weather.gov.sg/weather-marine-shipping-bulletin	Maritime forecast for next 24 hrs, together with associated marine weather, tidal and astronomical data, in English.

NAVTEX

C	Singapore (Changi)	518 kHz	1°20′·65N 103°58′·35E
Diagrams pages 37 and 188			
Weather Bulletins			
C: 0020 1220	12 hour forecast for Areas Phuket, Melaka, Tioman, Bunguran, Condore, Reef.		
Navigational Warnings			
C: 0020 1220	Storm warnings for the South China Sea, Malacca Straits, Andaman Sea.		
C: 0020 0420 0820 1220 1620 2020	Navigational Warnings for the South China Sea, Malacca Straits and Bay of Bengal.		

SINGAPORE PORT OPERATIONS CONTROL MRCC

Control Centre: 1°16′·99N 103°46′·76E

	Ch 09	VHF		
Weather Bulletins				
0100 0300 0500 0700 0900 1100 1300 1500 1700 1900 2100	Meteorological warnings.			
Navigational Warnings				
0100 0300 0500 0700 0900 1100 1300 1500 1700 1900 2100	Navigational warnings, including firing practice information.			

NOTE(S): 1. There are NO prior announcements on VHF Ch 16 before transmission of the above broadcasts.
2. In addition, the respective VTS stations broadcast urgent and safety related messages on an ad hoc basis – see ALRS Vol.6(4) for full details.

SOLOMON ISLANDS

INTERNET WEATHER SERVICES

Solomon Islands Meteorological Service www.met.gov.sb	Marine weather forecast in English.

SURINAME

INTERNET WEATHER SERVICES

Suriname Meteorological Service www.meteosur.sr	Maritime weather forecast, in English and Dutch.

MARITIME SAFETY INFORMATION (MSI) ON THE INTERNET

The internet is not part of the Maritime Safety Information system and should never be relied upon as the only means to obtain the latest forecast and warning information. Access to the service may be interrupted or delayed from time to time, updates may also be delayed. Please refer to GMDSS services, INMARSAT SafetyNET or international NAVTEX for the latest information. However, the following website(s) may prove useful to the mariner:

www.mas.sr/mas-publicaties/bericht-aan-zeevarenden	Suriname Maritime Authority	Navigation Warnings in Dutch.

SURINAME

PARAMARIBO (PZN)				
Control Centre: 5°50′·91N 55°09′·51W				
	2818	RT (MF)		
Weather Bulletins				
1233 2133 On request	Storm warnings, synopsis and forecast in English for Atlantic Ocean 5°N–15°N, 45°W–60°W.			

TAIWAN

INTERNET WEATHER SERVICES	
Central Weather Bureau www.cwb.gov.tw/V7e/forecast/bluehighway	Maritime weather information and predictions for coastal shipping routes around Taiwan, modelled on weather buoy data, in Chinese and English.

NAVTEX			
P[1]	Chi-lung	518 kHz	25°08′·09N 121°45′·29E
P[2]	Linyuan		22°29′·00N 120°25′·00E
Diagrams pages 37 and 217			
Weather Bulletins			
P[1]: 0630 1430 2230 P[2]: 0230 1030 1830	24 hour forecast for all Sea Areas.		
Navigational Warnings			
P[1]: 0630 1430 2230 P[2]: 0230 1030 1830	Navigational Warnings and warnings concerning military exercises for Taiwanese coastal waters.		
NOTE: Broadcasts are remotely controlled from Chi-Lung. The [P] time-slots broadcasts are transmitted alternately between the Chi-lung and Linyuan aerial sites.			

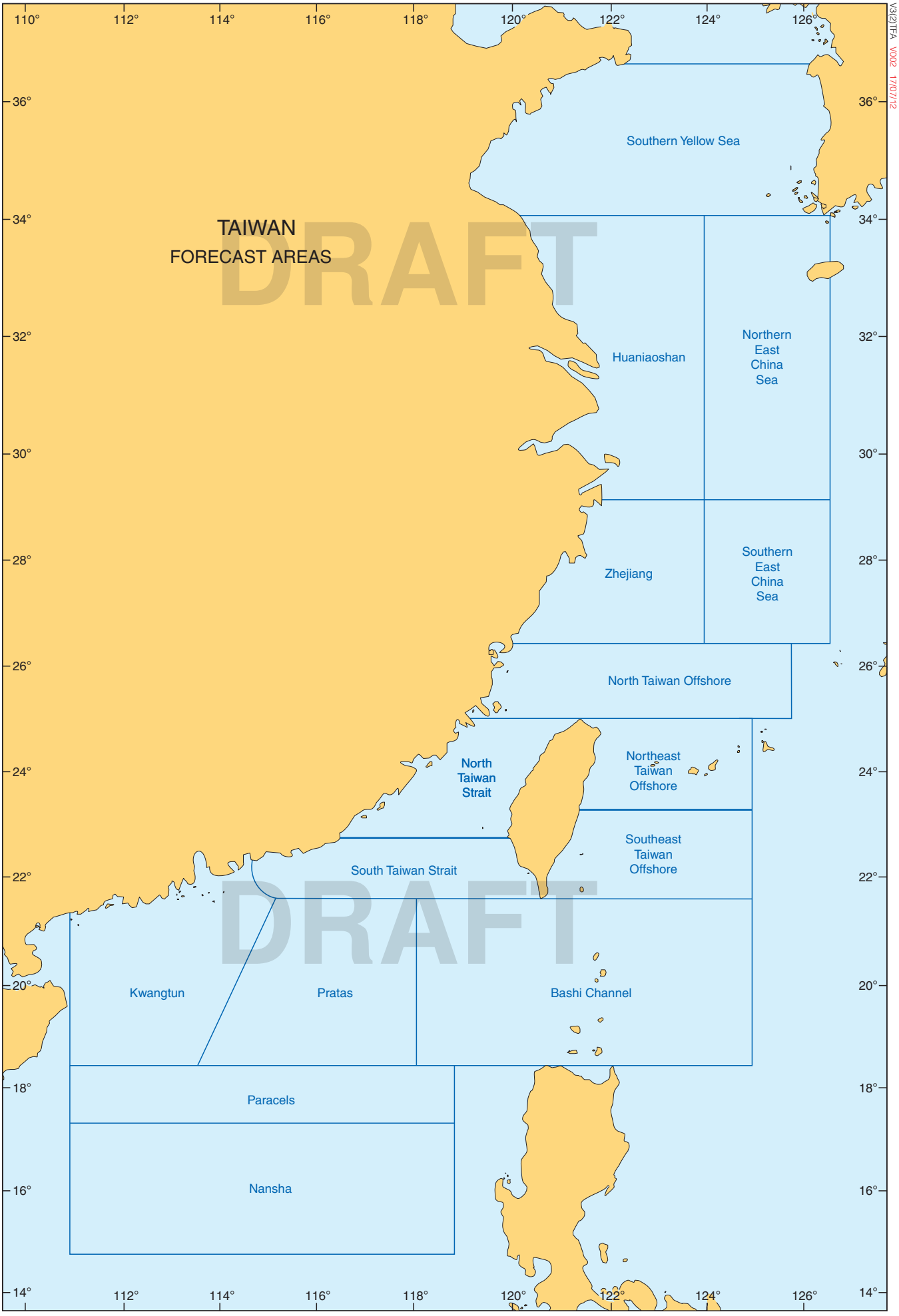
THAILAND

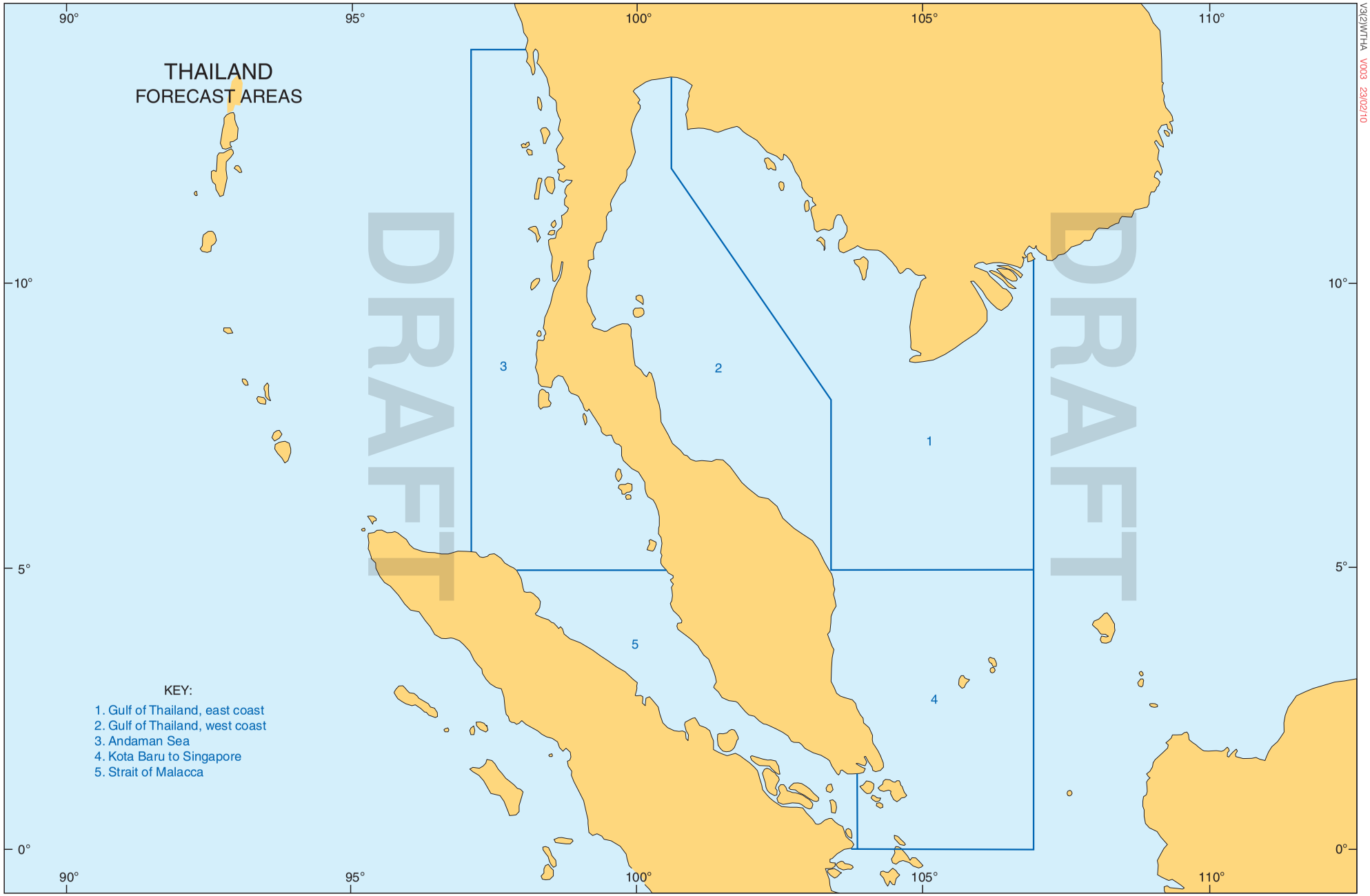
INTERNET WEATHER SERVICES	
Thailand Meteorological Department www.tmd.go.th	Select the required information by clicking on the 'Home' tab. Information available includes: shipping forecast for the next 24 hrs, wave forecasts, weather charts and weather radar data, in English and Thai.

NAVTEX			
F	Bangkok (Nonthaburi)	518 kHz	13°01′·47N 100°01′·20E
Diagrams pages 37 and 218			
Weather Bulletins			
F: 0050 0850	Synopsis for the area 0°–30°N, 90°E–120°E and 24 hour forecast for Sea Areas 1–5.		
Navigational Warnings			
F: 0050 0850	Storm warnings for the area 4°N–20°N, 98°E–115°E.		
F: 0050 0450 0850 1250 1650 2050	Navigational Warnings.		

THAILAND (East Coast)

BANGKOK (NONTHABURI) (HSA)				
Control Centre: 13°34′·00N 100°39′·00E				
	6765·1 8743	RT (HF)	Nonthaburi	
Diagram page 218				
Weather Bulletins				
0000 0300 0600 0900 1200 1500 1800 2100	Synopsis for area 0°–30°N, 90°E–120°E and 24 hour forecast for Sea Areas 1–5 in Thai and English.			
Navigational Warnings				
0000 0300 0600 0900 1200 1500 1800 2100	Storm warnings for area 4°N–20°N, 98°E–115°E in Thai and English.			


V3(2)TFA V002 17/07/12
110°
112°
114°
116°
118°
120°
122°
124°
126°
36°
34°
32°
30°
28°
26°
24°
22°
20°
18°
16°
14°
TAIWAN
FORECAST AREAS
DRAFT
DRAFT
Southern Yellow Sea
Huaniaoshan
Northern East China Sea
Zhejiang
Southern East China Sea
North Taiwan Offshore
North Taiwan Strait
Northeast Taiwan Offshore
Southeast Taiwan Offshore
South Taiwan Strait
Kwangtun
Pratas
Bashi Channel
Paracels
Nansha


THAILAND
FORECAST AREAS
90°
95°
100°
105°
110°
10°
5°
0°
1
2
3
4
5
KEY:
1. Gulf of Thailand, east coast
2. Gulf of Thailand, west coast
3. Andaman Sea
4. Kota Baru to Singapore
5. Strait of Malacca
DRAFT
DRAFT
V3(2)WTHA V003 23/02/10

TONGA ISLANDS

INTERNET WEATHER SERVICES

Tonga Meteorological & Coast Radio Services www.met.gov.to	Weather forecast, including Marine Weather Bulletin for all Tongan coastal waters, in English and Tongan.

NUKU'ALOFA (A3A)

Control Centre: 21°11′·15S 175°13′·08W

	2080	RT (MF)		
	4042[1] 6230	RT (HF)		
	Ch 12	VHF		
Weather Bulletins				
0133 0833 2033	Local weather reports for waters adjacent to Tonga and Niue.			

[1] 4042 kHz is the backup broadcast frequency if 6230 kHz is in use.

TRINIDAD AND TOBAGO

INTERNET WEATHER SERVICES

Trinidad and Tobago Meteorological Service www.metoffice.gov.tt	Weather observations, forecasts, storm warnings, satellite imagery and tidal information.

NORTH POST (TRINIDAD) (9YL)

Control Centre: 10°44′·91N 61°33′·77W

A	2735	RT (MF)		
B	Ch 14	VHF		
Weather Bulletins				
A: 1250 1850	12 hour forecast and outlook for further 12 hours for Trinidad, Tobago and Eastern Antilles in English.			
B: 1340 2040	12 hour forecast and outlook for further 12 hours for Trinidad and Tobago in English.			
Navigational Warnings				
A: On receipt	Storm warnings for Caribbean Sea, Antilles and adjacent Atlantic waters in English.			
B: On receipt	Storm warnings for Trinidad and Tobago in English.			
A: 1250 **B:** 2040	Navigational Warnings for Trinidad and Tobago in English.			

UNITED STATES

GENERAL NOTES

Radio Navigational Warnings:

Urgent marine navigational and weather information is broadcast over VHF Ch 22A (157·1MHz) after prior announcement on VHF Ch 16. All ships in U.S. waters over 20m in length, are required to monitor VHF Ch 16 and must have radios capable of tuning to the VHF simplex channel 22A.

UNITED STATES

INTERNET WEATHER SERVICES	
NOAA National Weather Service Marine Forecasts www.nws.noaa.gov/om/marine/home.htm	Web portal to marine forecasts, tidal information and associated items of interest.
NOAA National Weather Service FTPMail Service nws.ftpmail.ops@noaa.gov	E-mail address to be used for obtaining weather data and products via e-mail. Please see website www.nws.noaa.gov/tg/ftpmail_using.php for further details on this service.
NOAA National Service Change Notices www.weather.gov/os/notif.htm	Service Change Notices, Technical Implementation Notices and Data Management Messages.
NOAA National Weather Service Alaska Sea Ice Program (ASIP) www.weather.gov/afc/ice	Sea ice analysis, advisories, forecasts and 3 month outlooks for the area covered by the Alaska Sea Ice Program.
U.S National Ice Center/Naval Ice Center www.natice.noaa.gov/index.html	Both Arctic/Antarctic Ice conditions, in English. Various products and services are provided including: daily ice analysis data, ice edge information and forecasts, in a wide variety of downloadable formats.
NOAA National Data Buoy Center www.ndbc.noaa.gov/obs.shtml	Current and historic weather buoy observation data, including: wave height, dominant wave period, atmospheric pressure, air and sea temperature.
NOAA Ocean Prediction Center https://ocean.weather.gov/index.php	The OPC's redesigned website effective from 30th August 2017. Weather forecasts, analysis and model evaluation for U.S coastal areas and High Seas, together with associated information.
NOAA National Hurricane Center www.nhc.noaa.gov	Situation reports/predictions for tropical cyclones and disturbances for Atlantic and Eastern North Pacific regions, marine forecasts, tropical weather outlook, storm surge watches/warnings and associated information.

MARITIME SAFETY INFORMATION (MSI) ON THE INTERNET		
The internet is not part of the Maritime Safety Information system and should never be relied upon as the only means to obtain the latest forecast and warning information. Access to the service may be interrupted or delayed from time to time, updates may also be delayed. Please refer to GMDSS services, INMARSAT SafetyNET or international NAVTEX for the latest information. However, the following website(s) may prove useful to the mariner:		
http://msi.nga.mil/NGAPortal/MSI.portal	National Geospatial Intelligency Agency	Web portal to a variety of MSI information including: Notice to Mariners and Broadcast Warnings for NavArea IV and XII, as well as HYDROLANT, HYDROPAC AND HYDROARC warnings etc.
www.navcen.uscg.gov/?pageName=lnmMain	United States Coast Guard Navigation Center	Local Notices to Mariners – searchable by Coast Guard district, together with links to associated navigational and radio service information.

SUBMARINE EXERCISE AREAS

To avoid conflict between vessels conducting subsurface operations and submarines exercising in charted operating areas, any such vessels are requested to submit details of their intended operations to the following address in good time, prior to commencement: Commander Submarine Force, U.S. Atlantic Fleet, 7958 Blandy Rd., Norfolk, VA 23551-2492.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

NOAA TELEPHONE RECORDINGS

Many NWS forecast offices offer recorded marine and local forecasts as found on NOAA Weather Radio.

The National Data Buoy Center (NDBC) now offers a Dial-A-Buoy service. Mariners can now hear the latest coastal and offshore weather observations using Dial-A-Buoy. Dial-A-Buoy can also read the latest NWS marine forecast by zone, for most station locations. Dial-A-Buoy provides wind and wave measurements taken within the last hour at 65 buoys and 54 Coastal-Marine Automated Network (C-MAN) stations. The stations are located in the Atlantic, Pacific and Gulf of Mexico and are operated by the NDBC, a part of the NWS.

NATIONAL WEATHER SERVICE PHONE RECORDINGS OF MARINE FORECASTS

Dial-A-Buoy	888 7018992	

ATLANTIC COAST

Portland/Gray, ME	207 6883210	
Taunton, MA	508 8220634	
New York, NY	631 9240517	
Philadelphia/New Jersey	609 2616600	
Washington, DC/Maryland	703 9962200 ext 1	
	703 9962200 ext 0	Forecaster available for further assistance
Wakefield, VA	757 8994200	
Newport/Morehead City, NC	252 2235737	Forecaster available for further assistance

Continued on next page

UNITED STATES

National Oceanic and Atmospheric Administration (NOAA) (Continued)

Portland/Gray, ME	207 6883210	
Taunton, MA	508 8220634	
New York, NY	631 9240517	
Philadelphia/New Jersey	609 2616600	
Washington, DC/Maryland	703 9962200 ext 1	
	703 9962200 ext 0	Forecaster available for further assistance
Wilmington, NC	910 7624289	
Charleston, SC	843 7440303	
Jacksonville, FL	904 7414370	Forecaster available for assistance 0900-1700 LT
Melbourne, FL	321 2552900	
	321 2550212 ext 242	Forecaster available for further assistance
Miami, FL	305 2294550	
Key West, FL	305 2951316	
	305 2951316 ext 241	Answered by forecaster

GULF COAST

Tampa, FL	813 6452506	
Tallahassee, FL	850 9428851	
	850 9428833	Forecaster available for further assistance
New Orleans, LA	504 5227330	
Lake Charles, LA	337 4775285	Answered by forecaster
Houston/Galveston, TX	281 3375074	
Corpus Christi, TX	361 2891861	
	361 2890959 ext 1	Forecaster available for further assistance
Brownsville, TX	956 5041432	

PACIFIC COAST

Seattle, WA	206 5266087	
Portland, OR	503 8612722	
Medford, OR	541 7764305	
Eureka, CA	707 4436484	Forecaster available for further assistance
San Francisco, CA	831 6561725	
Los Angeles/Oxnard, CA	805 9886610	
San Diego, CA	858 6758700	

ALASKA

Juneau, AK	907 7906850	
Anchorage, AK	907 2665145	
Fairbanks, AK	907 4583745	

HAWAII

Hawaii – Forecast	808 9735286 ext 237	Answered by forecaster Forecaster available for further assistance
Hawaii – Oahu	808 9734380	
Hawaii – Maui	866 9445025	
Hawaii – Kaua'i	808 2456001	
Hawaii – Big Island	808 9358555	

PUERTO RICO

San Juan, PR	787 2534586	
	787 2534586 ext 241	Forecaster available for further assistance

GUAM

Guam	671 4720952	Answered by forecaster Forecaster available for further assistance

Continued overleaf

UNITED STATES

National Oceanic and Atmospheric Administration (NOAA) (Continued)

NOAA TSUNAMI WARNING SYSTEM

Tsunami Warning System

NOAA operates two tsunami warning centres in the United States: The National Tsunami Warning Center (NTWC) and the Pacific Tsunami Warning Center (PTWC). The NTWC area of responsibility consists of the Canadian coastal regions, Puerto Rico and the US Virgin Islands and the ocean coasts of all the US states except Hawaii. The PTWC area of responsibility consists of Hawaii, other US interests in the Pacific Basin, countries participating in the Tsunami Warning System in the Pacific, and on an interim basis Indian Ocean and other Caribbean Sea countries.

Messages

Products issued by the tsunami warning centers are warning, watch, advisory and information statement. Each has a distinct meaning relating to local emergency response.

Tsunami warnings: A tsunami warning is issued when a potential tsunami with significant widespread inundation is imminent or expected. Warnings alert the public that widespread dangerous coastal flooding accompanied by powerful currents is possible and may continue for several hours after arrival of the initial wave. Warnings also alert emergency management officials to take action for the entire tsunami hazard zone. Appropriate actions to be taken by local officials may include the evacuation of low-lying coastal areas and repositioning vessels to deep waters when there is time to safely do so. Warnings may be updated, adjusted geographically, downgraded or cancelled. To provide the earliest possible alert, initial warnings are normally based only on seismic information.

Tsunami Watch: A tsunami watch is issued to alert emergency management officials and the public of an event that may later impact the watch area. The watch area may be upgraded to a warning or advisory or cancelled based on updated information and analysis. Therefore emergency management officials and the public should prepare to take action. Watches are normally issued based on seismic information without confirmation that a destructive tsunami is underway.

Tsunami Advisory: A tsunami advisory is issued for the threat of a potential tsunami that may produce strong currents or waves dangerous to those in or near the water. Coastal regions historically prone to damage due to strong currents induced by tsunamis are at the greatest risk. The threat may continue for several hours after the arrival of the initial wave, but significant widespread inundation is not expected for areas under an advisory. Appropriate actions to be taken by local officials may include closing beaches, evacuating harbours and marinas and repositioning vessels to deep waters when there is time to safely do so. Advisories are normally updated to continue the advisory, expand / contract the affected areas, upgrade to a warning or cancel the advisory.

Tsunami Information Statement: A tsunami information statement is issued to inform emergency management officials and the public that an earthquake has occurred, or that a tsunami warning, watch or advisory has been issued for another section of the ocean. In most cases information statements are issued to indicate there is no threat of a destructive tsunami and to prevent unnecessary evacuations because the earthquake may have been felt in coastal areas. An information statement may, in appropriate situations, caution about the possibility of destructive local tsunamis. Information statements may be reissued with additional information, though normally these messages are not updated, However a watch, advisory or warning may be issued for the area if necessary after analysis and / or updated information becomes available.

Tsunami Warning Dissemination: Tsunami warning, watch and information bulletins are disseminated to appropriate emergency authorities and the general public through:

Local, national and international users (as well as the media) who in turn disseminate to the public through commercial radio and TV channels
NOAA Weather Radio through a network of VHF sites
US Coast Guard broadcasts on MF and VHF
Local Emergency Managment responsible for formulating and executing evacuation plans
NOAA Weather Wire satellite broadcast service
Federal Aviation Administration and Military communication systems
Internet: http://ntwc.arh.noaa.gov

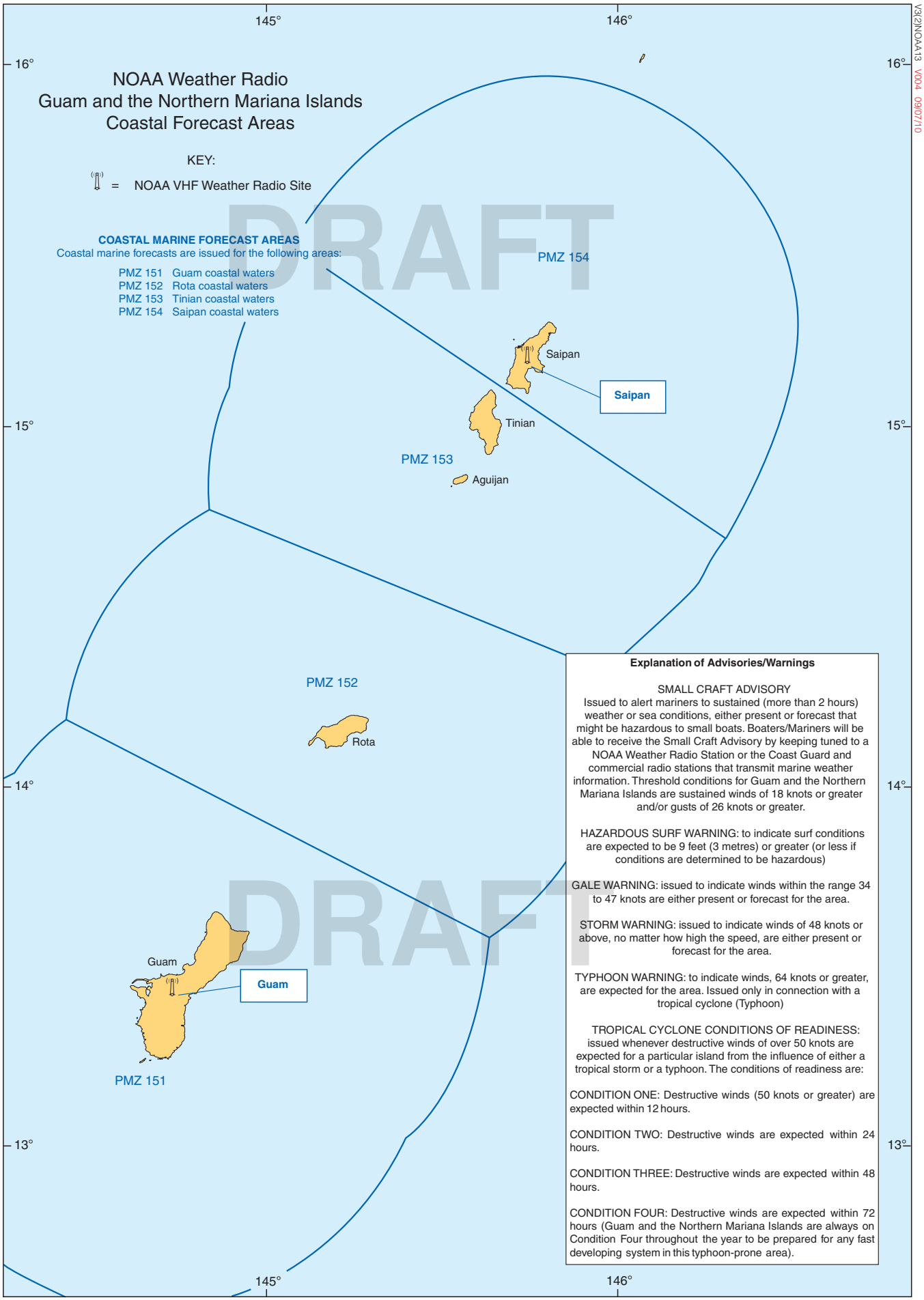
NOAA WEATHER RADIO (NWR)

Diagrams pages 210, 223, 233, 234, 235, 236, 239, 240, 241, 242, 243, 246, 250, 252, 257, 259, 260 and 261

NOAA Weather Radio (NWR) is a nationwide network of radio stations broadcasting continuous weather information direct from National Weather Service (NWS) offices. NWR broadcasts NWS warnings, watches, forecasts and other hazard information.
In areas where NOAA Weather Radio broadcasts provide complete overlapping coverage of the US Coast Guard VHF network, the US Coast Guard may elect to broadcast storm warnings only and not routinely broadcast NWS marine forecasts.

NOAA Weather Radio Frequencies	
162·550 MHz	Ch WX 1
162·400 MHz	Ch WX 2
162·475 MHz	Ch WX 3
162·425 MHz	Ch WX 4
162·450 MHz	Ch WX 5
162·500 MHz	Ch WX 6
162·525 MHz	Ch WX 7

Continued on page 224



Explanation of Advisories/Warnings

SMALL CRAFT ADVISORY
Issued to alert mariners to sustained (more than 2 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. Threshold conditions for Guam and the Northern Mariana Islands are sustained winds of 18 knots or greater and/or gusts of 26 knots or greater.

HAZARDOUS SURF WARNING: to indicate surf conditions are expected to be 9 feet (3 metres) or greater (or less if conditions are determined to be hazardous)

GALE WARNING: issued to indicate winds within the range 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.

TYPHOON WARNING: to indicate winds, 64 knots or greater, are expected for the area. Issued only in connection with a tropical cyclone (Typhoon)

TROPICAL CYCLONE CONDITIONS OF READINESS: issued whenever destructive winds of over 50 knots are expected for a particular island from the influence of either a tropical storm or a typhoon. The conditions of readiness are:

CONDITION ONE: Destructive winds (50 knots or greater) are expected within 12 hours.

CONDITION TWO: Destructive winds are expected within 24 hours.

CONDITION THREE: Destructive winds are expected within 48 hours.

CONDITION FOUR: Destructive winds are expected within 72 hours (Guam and the Northern Mariana Islands are always on Condition Four throughout the year to be prepared for any fast developing system in this typhoon-prone area).

UNITED STATES

National Oceanic and Atmospheric Administration (NOAA) (Continued)

The NWR network provides voice broadcasts of local and coastal marine forecasts on a continuous cycle. The forecasts are produced by local NWS Forecast Offices. Coastal stations also broadcast predicted tides and real time observations from buoys and coastal meteorological stations operated by NOAA's National Data Buoy Center. Based on user demand and where feasible, Offshore and Open Lake forecasts are broadcast as well.

Coverage

The NWR network provides near continuous coverage of the coastal US, Great Lakes, Hawaii and populated Alaskan coastline. Typical coverage is 25 n miles offshore, but may extend much further in certain areas.
Locations of coastal NWR stations are shown on the following diagrams and are listed below in the table of stations.
Several NWR transmitters operate as "Marine-Only", broadcasting marine information on a more rapid cycle than is possible with "All-Hazard" transmitters.

Equipment

Channel numbers e.g. WX1, WX2 etc. have no special significance but are often designated this way in consumer equipment. Other channel numbering schemes are also prevalent.
Many NWR receivers are also programmed with the additional frequencies 161·65 MHz (VHF Ch 21B) and 161·775 MHz (VHF Ch 83B) which are used by Canada for marine weather broadcasts.
Most VHF marine radiotelephones have the ability to receive NWR broadcasts. However, it is recommended that a separate NWR receiver be carried aboard so that mariners may maintain a simultaneous watch on NWR and marine VHF Channels.

Streaming Audio, MP3 and Podcasts

Streaming Audio is available for several NWR transmitting stations. The number of stations carried live on the Internet has so far been limited to sites with sufficient computer capacity to support the additional information load and commercial sites who rebroadcast the program.
Experimental recorded MP3 and Podcast files are available for a limited number of marine areas such as Alaska. Check with the local forecast office for availability.

SAME Alerts

A digital encoding system incorporating newer technology known as Specific Area Message Encoding (SAME) allows receivers equipped with the SAME feature to sound an alert only for certain weather conditions or within a limited geographic area such as a county.
At present, few VHF marine radiotelephones contain the SAME feature. These require an active NWR channel to be selected in order for the mariner to be alerted.
When using the NWR receiver it must be programmed to the proper frequency, SAME geographic code(s) and the SAME event code(s) in order to function as intended.

SAME Geographic Codes

SAME geographic codes are used to program SAME-capable NWR receivers to receive alert messages for user-specified areas.
For a listing of marine SAME geographic codes, see 'NOAA WEATHER RADIO County by County Coverage' or 'Marine Text Forecasts by Zone'. NOTE: Although SAME geographic codes exist for offshore forecast zones, Great Lakes MAFOR's and forecast synopses they are not broadcast on NWR. Marine SAME geographic codes do not presently utilize the 'County Subsection' of the SAME geographic code and therefore the SAME geographic code for all marine zones begin with a leading zero.
It is recommended that mariners also program their receivers with the SAME geographic codes of neighbouring land and marine areas to maintain a greater level of weather awareness.

SAME Geographic Codes for Mariners in Transit

For mariners in transit who are using NWR receivers with SAME capability, it is recommended the radio be set to the 'All County Code Option' to avoid the need to continually reprogram the unit as the vessel moves along the coast to prevent the possibility of missing important warnings. In this mode the receiver will alarm for all watches, warnings and emergency messages much like a conventional warning alarm receiver ensuring the greatest margin of safety.
Caution! – Several NWR SAME receivers contain a capability for receiving SAME alerts for all counties within a given state by setting the 'county code' portion of the SAME geographic code to '000', e.g. 024000 for the state of Maryland. However, SAME geographic codes for marine areas use pseudo-state codes as in the table below and therefore such a receiver will not alert for marine events unless properly programmed with the pseudo-state code for the user's marine area as follows:

Pseudo-State Code	Marine Area
73	Western North Atlantic Ocean and along US East Coast from Canadian border south to Currituck Beach Light
75	Western North Atlantic Ocean and along US East Coast south of Currituck Beach Light following the coastline into Gulf of Mexico to Bonita Beach including the Caribbean
77	Gulf of Mexico and along the US Gulf Coast from the Mexican border to Bonita Beach
57	Eastern North Pacific Ocean and along US West Coast from Canadian border to Mexican border
58	North Pacific Ocean near Alaska and along Alaska coastline including the Bering Sea and the Gulf of Alaska
59	Central Pacific Ocean including Hawaiian waters
65	Western Pacific Ocean including Mariana Islands waters
61	South Central Pacific Ocean including American Samoa waters

Therefore for example, a mariner on Chesapeake Bay in Maryland using a NWR receiver with a SAME alert capability for receiving alerts for all counties within a given state might wish to enter a SAME geographic code of '073000' to receive warnings of any marine weather event in the general area, rather than having to

Continued on next page

UNITED STATES

National Oceanic and Atmospheric Administration (NOAA) (Continued)

program the receiver for several neighbouring marine zones. However, entering the SAME geographic code for Maryland, '024000', would not alert the user of any marine weather events.

SAME Event Codes

At present consumer radio equipment incorporating SAME, generally alert by geographic area only and not for specific weather conditions (no user-progammable SAME event codes). If the receiver contains this feature, the mariner should program their receiver for the following SAME event codes which are applicable to marine zones.

EVENT	SAME EVENT CODE
Hurricane Watch*	HUA
Hurricane Warning*	HUW
Hurricane Local Statement*	HLS
Severe Thunderstorm Watch	SVA
Severe Weather Statement	SVS
Special Marine Warning	SMW
Tropical Storm Watch*	TRA
Tropical Storm Warning*	TRW
Tsunami Watch	TSA
Tsunami Warning	TSW

Events marked * are not applicable to Great Lakes and Alaska forecast areas.

EXPLANATION OF ADVISORIES/WARNINGS

Hurricane Watch is an announcement issued whenever a tropical storm or hurricane becomes a threat to a coastal area. The "Hurricane Watch" announcement is not a warning, but indicates that the hurricane is near enough that everyone in the area covered by the "Watch" should listen to their radios for subsequent advisories and be ready to take precautionary action in case hurricane warnings are issued.

Hurricane Warning: Issued only in connection with a tropical cyclone (hurricane) to indicate that winds of 64 knots and above are forecast for this area.

Storm Warning indicates winds of 48 knots and above, no matter how high the speed, are forecast for the area. However, if the winds are associated with a tropical cyclone (hurricane), the STORM WARNING indicates that winds within the range 48–63 knots are forecast.

Gale Warning indicates winds within the range of 34 to 47 knots are forecast for the area.

Special Marine Warning is issued whenever a severe local storm or strong wind of brief duration is imminent and is not covered by existing warnings or advisories.

Small Craft Advisory: To alert mariners to weather or sea conditions, that might be hazardous to small boats. Decision as to the degree of hazard will be left to the mariner based on experience and the size and type of craft. There is no legal definition of the term "small craft".

COASTAL NOAA WEATHER RADIO STATIONS

Stations	Callsign	Frequency (MHz)	Forecast Areas	Approximate Position
ALASKA				
Althorp Peak	KZZ86	162·425	PKZ011 PKZ022 PKZ032 PKZ033 PKZ041 PKZ042 PKZ043 PKZ051 PKZ052 PKZ099[1]	58°05'·60N 136°24'·77W
Anchorage	KEC43	162·550	PKZ121 PKZ125 PKZ129 PKZ139 PKZ140 PKZ141 PKZ197[1]	61°12'·90N 149°54'·00W
Barrow	KZZ53	162·550	PKZ225 PKZ230 PKZ235 PKZ240 PKZ245 PKZ298[1]	71°17'·25N 156°46'·47W
Bede Mt	WNG528	162·450	PKZ119 PKZ120 PKZ121 PKZ130 PKZ131 PKZ132 PKZ139 PKZ140 PKZ141	59°18'·62N 151°56'·63W
Bethel	WNG675	162·550	PKZ160 PKZ179 PKZ180 PKZ181 PKZ185 PKZ199[1]	60°46'·95N 161°53'·09W
Cape Fanshaw	KZZ88	162·425	PKZ013 PKZ021 PKZ031 PKZ032 PKZ033 PKZ034 PKZ098[1]	57°12'·28N 133°27'·95W
Cape Gull	WNG529	162·500	PKZ132 PKZ136 PKZ137 PKZ138 PKZ150 PKZ155	58°11'·85N 154°12'·40W
Cape Hinchinbrook	WNG532	162·525	PKZ119 PKZ120 PKZ125 PKZ126 PKZ127 PKZ128 PKZ129 PKZ197[1]	60°15'·32N 146°36'·55W
Cold Bay	KJY87	162·425	PKZ150 PKZ155 PKZ160 PKZ165 PKZ170 PKZ171 PKZ172 PKZ173 PKZ174 PKZ175 PKZ176 PKZ179 PKZ199[1]	55°14'·80N 162°45'·95W
Cordova	WXJ79	162·400	PKZ119 PKZ120 PKZ125 PKZ126 PKZ127 PKZ128 PKZ129 PKZ197[1]	60°32'·97N 145°45'·10W
Craig	KXI80	162·475	PKZ041 PKZ042 PKZ043 PKZ098[1] PKZ099[1]	55°28'·52N 133°08'·98W
Dillingham	WNG681	162·500	PKZ160 PKZ165 PKZ170 PKZ172 PKZ179 PKZ180 PKZ181 PKZ199[1]	59°02'·50N 158°27'·50W
Duffield Peninsula	WZ2555	162·525	Details Unknown	57°30′·00N 135°26′·0W

Continued overleaf

UNITED STATES

National Oceanic and Atmospheric Administration (NOAA) (Continued)

Stations	Callsign	Frequency (MHz)	Forecast Areas	Approximate Position
Duke Island	KZZ92	162·450	PKZ035 PKZ036 PKZ041 PKZ042 PKZ043 PKZ098[1]	54°53'·00N 131°21'·00W
Dutch Harbor (Unalaska)	WXK89	162·550	PKZ150 PKZ155 PKZ160 PKZ165 PKZ170 PKZ171 PKZ172 PKZ173 PKZ174 PKZ175 PKZ176 PKZ179 PKZ199[1]	53°52'·54N 166°32'·51W
East Point	WNG530	162·500	PKZ119 PKZ120 PKZ125 PKZ126 PKZ127 PKZ128 PKZ129 PKZ197[1]	60°38'·70N 147°20'·81W
Gravina Island	KZZ96	162·525	PKZ035 PKZ036 PKZ041 PKZ042 PKZ043 PKZ098[1]	55°22'·00N 131°48'·00W
Haines	WXM97	162·400	PKZ011 PKZ012 PKZ013 PKZ098[1]	59°15'·00N 135°28'·00W
Homer	WXJ24	162·400	PKZ119 PKZ120 PKZ121 PKZ130 PKZ131 PKZ132 PKZ139 PKZ140 PKZ141 PKZ197[1]	59°40'·81N 151°37'·53W
Juneau	WXJ25	162·550	PKZ013 PKZ021 PKZ031 PKZ032 PKZ033 PKZ034 PKZ098[1]	58°18'·14N 134°26'·57W
Ketchikan	WXJ26	162·550	PKZ035 PKZ036 PKZ041 PKZ042 PKZ043 PKZ098[1]	55°26'·00N 131°49'·00W
Kodiak	WXJ78	162·550	PKZ132 PKZ136 PKZ137 PKZ138 PKZ150 PKZ155	57°44'·81N 152°29'·60W
Kotzebue	KWN30	162·550	PKZ215 PKZ220 PKZ299[1]	66°53'·54N 162°35'·40W
Marmot Island	WNG716	162·500	PKZ132 PKZ136 PKZ137 PKZ138 PKZ150 PKZ155	58°14'·00N 151°49'·00W
Middle Cape	WZ2556	162·525	Details Unkown	57°21′·0N 154°46′·0W
Mt McArthur	KZZ95	162·525	PKZ011 PKZ022 PKZ032 PKZ033 PKZ041 PKZ042 PKZ043 PKZ051 PKZ052 PKZ099[1]	56°04'·27N 134°11'·54W
Mt Robert Barron	KZZ87	162·450	PKZ013 PKZ021 PKZ032 PKZ033 PKZ034 PKZ098[1]	58°14'·00N 134°50'·00W
Ninilchik	KZZ97	162·550	PZK119 PKZ120 PKZ121 PKZ130 PKZ131 PKZ132 PKZ139 PKZ140 PKZ141	60°03'·00N 151°38'·82W
Nome	WXJ62	162·550	PKZ200 PKZ210 PKZ299[1]	64°29'·30N 165°18'·73W
Pillar Mt	WNG531	162·525	PKZ132 PKZ136 PKZ137 PKZ138 PKZ150 PKZ155	57°47'·21N 152°26'·51W
Point Pigot	KZZ93	162·450	PKZ119 PKZ120 PKZ125 PKZ129 PKZ197[1]	60°49'·03N 148°22'·80W
Potato Point	WNG527	162·425	PKZ119 PKZ120 PKZ125 PKZ126 PKZ127 PKZ128 PKZ129 PKZ197[1]	61°03'·39N 146°41'·83W
Raspberry Island	KZZ90	162·425	PKZ132 PKZ136 PKZ137 PKZ138 PKZ150 PKZ155	58°03'·96N 153°22'·60W
Rugged Island	WNG526	162·425	PKZ119 PKZ120 PKZ121 PKZ125 PKZ130 PKZ131 PKZ132 PKZ197[1]	59°51'·66N 149°23'·33W
Saint Paul Island	KJY73	162·525	PKZ150 PKZ155 PKZ160 PKZ165 PKZ170 PKZ171 PKZ172 PKZ173 PKZ174 PKZ175 PKZ176 PKZ179 PKZ199[1]	57°07'·10N 170°17'·00W
Sand Point	WNG714	162·550	PKZ150 PKZ155 PKZ160 PKZ165 PKZ199[1]	55°20'·39N 160°29'·27W
Seward	KEC81	162·550	PKZ119 PKZ120 PKZ121 PKZ125 PKZ130 PKZ131 PKZ132 PKZ197[1]	60°06'·00N 149°22'·00W
Sitka	WXJ80	162·550	PKZ011 PKZ022 PKZ032 PKZ033 PKZ041 PKZ042 PKZ043 PKZ051 PKZ052 PKZ099[1]	56°51'·16N 135°31'·74W
Sitkinak Dome	WNG718	162·450	PKZ132 PKZ136 PKZ137 PKZ138 PKZ150 PKZ155	56°34'·09N 154°10'·63W
Soldotna	WWG39	162·475	PKZ130 PKZ131 PKZ139 PKZ140 PKZ141 PKZ197[1]	60°31'·92N 151°05'·05W
Sukkwan Island	KZZ89	162·425	PKZ041 PKZ042 PKZ043 PKZ098[1] PKZ099[1]	55°07'·00N 132°46'·00W
Tripod Mt	WNG715	162·450	PKZ120 PKZ125 PKZ126 PKZ127 PKZ128 PKZ129 PKZ197[1]	60°32'·97N 145°45'·11W
Tuklung Mt	WNG525	162·425	PKZ160 PKZ165 PKZ170 PKZ179 PKZ180 PKZ199[1]	58°51'·45N 159°27'·95W
Valdez	WXJ63	162·550	PKZ119 PKZ120 PKZ125 PKZ126 PKZ127 PKZ128 PKZ129 PKZ197[1]	61°07'·44N 146°21'·14W
Whittier	KXI29	162·475	PKZ120 PKZ125 PKZ126 PKZ127 PKZ128 PKZ129 PKZ197[1]	60°47'·00N 148°41'·00W
Wrangell	WXJ83	162·400	PKZ034 PKZ035 PKZ036 PKZ098[1]	56°28'·24N 133°56'·55W
Yakutat	WXK69	162·400	PKZ051 PKZ052 PKZ053 PKZ097[1] PKZ099[1]	58°24'·40N 135°45'·29W
Zarembo Island	KZZ91	162·450	PKZ034 PKZ035 PKZ036 PKZ098[1]	56°21'·00N 132°52'·00W

[1] Forecast synopsis.

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National Oceanic and Atmospheric Administration (NOAA) (Continued)

ATLANTIC COAST CONNECTICUT				
Meriden	WXJ42	162·400	ANZ300[1] ANZ330 ANZ335	41°34'·00N 72°51'·00W
New London	KHB47	162·550	ANZ235 ANZ237 ANZ256 ANZ300[1] ANZ330 ANZ340	41°26'·00N 72°08'·00W

DELAWARE				
Lewes	WXJ94	162·550	ANZ400[1] ANZ430 ANZ431 ANZ453 ANZ454 ANZ455 ANZ470[2]	38°47'·28N 75°09'·66W
Salisbury	KEC92	162·475	ANZ455 ANZ533 ANZ534 ANZ538 ANZ539 ANZ540 ANZ541 ANZ542 ANZ543 ANZ630 ANZ650 ANZ670[2]	38°30'·00N 75°39'·00W

FLORIDA				
Daytona Beach	KIH26	162·400	AMZ454[2] AMZ474[2] AMZ500[1] AMZ550 AMZ570	29°12'·03N 81°01'·00W
Fort Pierce	WWF69	162·425	AMZ500[1] AMZ555 AMZ575	27°27'·00N 80°25'·00W
Jacksonville	KHB39	162·550	AMZ400[1] AMZ450 AMZ452 AMZ454 AMZ470 AMZ472 AMZ474	30°20'·17N 81°31'·10W
Key West	WXJ95	162·400	GMZ005[1] GMZ032 GMZ033 GMZ034 GMZ035 GMZ043 GMZ044 GMZ053 GMZ054 GMZ055 GMZ073 GMZ074 GMZ075	24°39'·58N 81°31'·83W
Melbourne	WXJ70	162·550	AMZ500[1] AMZ552 AMZ572	28°05'·05N 80°37'·03W
Miami	KHB34	162·550	AMZ600[1] AMZ651 AMZ671	25°43'·00N 80°17'·00W
Orlando	KIH63	162·475	AMZ500[1] AMZ552[5] AMZ572[5]	28°32'·00N 81°22'·00W
Palatka	WNG522	162·425	AMZ400[1] AMZ450 AMZ452 AMZ454 AMZ472 AMZ474	29°39'·00N 81°39'·00W
Princeton	WNG663	162·425	AMZ630 GMZ031 GMZ042 GMZ052 GMZ072	25°32'·42N 80°28'·10W
Tea Table Key	WWG60	162·450	GMZ005[1] GMZ031 GMZ032 GMZ042 GMZ043 GMZ052 GMZ053 GMZ072 GMZ073	24°53'·57N 80°39'·53W
West Palm Beach	KEC50	162·475	AMZ650 AMZ670	24°53'·57N 80°39'·53W

GEORGIA				
Brunswick	WWH39	162·425	AMZ354 AMZ374 AMZ400[1] AMZ450 AMZ470	31°12'·00N 81°29'·00W
Savannah	KEC85	162·400	AMZ300[1] AMZ352 AMZ354 AMZ370[2] AMZ374	32°04'·37N 81°04'·77W
Waycross	WXK75	162·475	AMZ400[1] AMZ450 AMZ470	31°13'·00N 82°34'·00W

MAINE				
Dresden	WSM60	162·475	ANZ100[1] ANZ150 ANZ152 ANZ170[2]	44°07'·00N 69°41'·00W
Ellsworth	KEC93	162·400	ANZ005[1] ANZ051 ANZ052 ANZ070[2] ANZ151	44°33'·00N 68°31'·00W
Falmouth	KDO95	162·550	ANZ100[1] ANZ153 ANZ154 ANZ170[2]	43°46'·00N 70°19'·00W
Jonesboro (Marine)	WNG543	162·450	ANZ005[1] ANZ050 ANZ051 ANZ052 ANZ070[2]	44°40'·00N 67°34'·00W

MARYLAND				
Baltimore	KEC83	162·400	ANZ500[1] ANZ530[4] ANZ531[4] ANZ532[4] ANZ533[4] ANZ538[4] ANZ539[4] ANZ540[4] ANZ541[4] ANZ542[4] ANZ650[2]	39°23'·00N 76°44'·00W
Sudlersville	WXK97	162·500	ANZ400[1] ANZ430 ANZ431 ANZ530 ANZ531 ANZ532 ANZ533 ANZ538 ANZ539 ANZ540 ANZ541	39°11'·00N 75°55'·00W

MASSACHUSETTS				
Boston	KHB35	162·475	ANZ230 ANZ231 ANZ250 ANZ251 ANZ270[2] ANZ271[2]	42°13'·00N 71°07'·00W
Gloucester (Marine)	WNG574	162·425	ANZ230 ANZ231 ANZ250 ANZ251 ANZ254 ANZ270[2]	42°36'·00N 70°39'·00W
Bourne/Hyannis	KEC73	162·550	ANZ231 ANZ232 ANZ233 ANZ234 ANZ250 ANZ251 ANZ254 ANZ255 ANZ256 ANZ271[2] ANZ272[2]	41°43'·00N 70°34'·00W
Worcester	WXL93	162·550	ANZ230	42°16'·00N 71°48'·00W

NEW HAMPSHIRE				
Deerfield	KZZ40	162·450	ANZ100[1] ANZ154 ANZ170[2]	43°09'·00N 71°13'·00W

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UNITED STATES

National Oceanic and Atmospheric Administration (NOAA) (Continued)

NEW JERSEY				
Atlantic City	KHB38	162·400	ANZ400[1] ANZ430 ANZ431 ANZ450 ANZ451 ANZ452 ANZ453 ANZ454 ANZ455 ANZ470[2]	39°22'·87N 74°27'·00W
Hardyston	KZZ31	162·500	ANZ400[1] ANZ450 ANZ451 ANZ452 ANZ453	41°07'·00N 74°33'·00W
Howell Township (Southard)	WXM60	162·450	ANZ400[1] ANZ450 ANZ451 ANZ452 ANZ453 ANZ470[2]	40°08'·23N 74°13'·21W

NEW YORK				
New York City	KWO35	162·550	ANZ300[1] ANZ335 ANZ338 ANZ345 ANZ353 ANZ355 ANZ370[2] ANZ450[2] ANZ451[2]	40°46'·00N 73°59'·00W
Riverhead	WXM80	162·475	ANZ300[1] ANZ330 ANZ340 ANZ345 ANZ350 ANZ353 ANZ370[2]	40°53'·09N 72°41'·49W

NORTH CAROLINA				
Cape Hatteras	KIG77	162·475	AMZ130[2] AMZ131[2] AMZ135[4] AMZ136[2] AMZ150[2] AMZ152[4] AMZ154[4] AMZ156[2] AMZ170[2] ANZ830[3] ANZ833[3]	35°16'·03N 75°32'·59W
Mamie	WWH26	162·425	AMZ130[4] AMZ131[4] AMZ150[4] AMZ152[2] AMZ170[2] ANZ828[3] ANZ830[3]	36°07'·12N 75°49'·99W
New Bern	KEC84	162·400	AMZ135[4] AMZ136[4] AMZ137[4] AMZ156[4] AMZ158[4] AMZ170[2] ANZ833[3]	35°08'·00N 77°03'·00W
Winnabow	KHB31	162·550	AMZ250 AMZ252 AMZ270[2]	34°07'·90N 78°11'·27W
Windsor	WNG537	162·525	AMZ135 AMZ150 AMZ152 ANZ633 ANZ658 ANZ670[2]	36°00'·00N 76°57'·00W

PENNSYLVANIA				
Allentown	WXL39	162·400	ANZ400[1] ANZ430 ANZ431 ANZ450 ANZ451 ANZ452 ANZ453	40°36'·00N 75°29'·00W
Coatesville (Hibernia Park)	WNG704	162·400	ANZ430	40°01'·80N 75°50'·50W
Philadelphia	KIH28	162·475	ANZ400[1] ANZ430 ANZ431 ANZ450 ANZ451 ANZ452 ANZ453 ANZ454 ANZ455 ANZ470[2]	39°57'·17N 75°09'·81W

PUERTO RICO				
Culebra	WNJ693	162·450	AMZ700[1] AMZ710 AMZ712 AMZ715 AMZ722 AMZ725 AMZ732 AMZ735	18°20'·01N 65°18'·61W
Maricao	WXJ68	162·550	AMZ700[1] AMZ710 AMZ712 AMZ732 AMZ735 AMZ741 AMZ742 AMZ745	18°08'·98N 66°59'·00W
San Juan	WXJ69	162·400	AMZ700[1] AMZ710 AMZ712 AMZ715 AMZ722 AMZ725 AMZ732 AMZ735	18°16'·00N 66°05'·00W

RHODE ISLAND				
Providence	WXJ39	162·400	ANZ233 ANZ234 ANZ235 ANZ236 ANZ237 ANZ255 ANZ256 ANZ273[2]	41°48'·29N 71°28'·36W

SOUTH CAROLINA				
Beaufort	WXJ23	162·450	AMZ300[1] AMZ350 AMZ352 AMZ370[2]	32°42'·72N 80°40'·05W
Charleston	KHB29	162·550	AMZ300[1] AMZ330 AMZ350 AMZ370[2]	32°55'·47N 79°41'·95W
Conway/Myrtle Beach (Aynor)	KEC95	162·400	AMZ254 AMZ270[2]	33°57'·00N 79°07'·00W
Georgetown	WNG628	162·500	AMZ256 AMZ270[2]	33°22'·00N 79°18'·00W

US VIRGIN ISLANDS				
St. Croix	WNG677	162·500	AMZ700[1] AMZ710 AMZ712 AMZ715 AMZ722 AMZ725 AMZ732 AMZ735	17°43'·12N 64°51'·44W

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National Oceanic and Atmospheric Administration (NOAA) (Continued)

VIRGINIA				
Accomack	KJY99	162·525	ANZ543 ANZ630 ANZ631 ANZ652 ANZ654	37°43'·12N 75°40'·04W
Fredericksburg	WZ2527	162·425	ANZ536[4] ANZ537[4]	38°18'·11N 77°28'·25W
Heathsville	WXM57	162·400	ANZ534 ANZ537 ANZ541 ANZ542 ANZ543 ANZ630 ANZ631 ANZ635	37°54'·00N 76°29'·00W
Manassas	KHB36	162·550	ANZ500[1] ANZ532[4] ANZ533[4] ANZ535[4] ANZ536[4] ANZ537[4] ANZ540[4] ANZ541[4] ANZ542[4] ANZ650[2]	38°38'·00N 77°26'·00W
Norfolk	KHB37	162·550	ANZ632 ANZ633 ANZ634 ANZ636[2] ANZ637[2] ANZ638 ANZ654 ANZ656 ANZ658 ANZ670[2]	36°49'·00N 76°28'·00W

[1] Forecast synopsis.
[2] Used for watch/warning purposes only and not routine forecasts.
[3] Offshore forecast zone.
[4] Generalized forecast broadcast in lieu of forecast for specific zone.
[5] Routine forecast only, no warnings.

GULF COAST ALABAMA				
Mobile	KEC61	162·550	GMZ600[1] GMZ630 GMZ631 GMZ632 GMZ633 GMZ634 GMZ635 GMZ650 GMZ670	30°36'·37N 88°11'·47W

FLORIDA				
East Point	WWF86	162·500	GMZ730 GMZ750 GMZ755 GMZ765 GMZ770 GMZ775	29°44'·00N 84°53'·00W
Fort Myers	WXK83	162·475	GMZ800[1] GMZ836 GMZ856 GMZ876	26°38'·00N 81°49'·00W
Gainesville	WXJ60	162·475	GMZ755[2] GMZ775[2]	29°40'·80N 82°25'·80W
Inverness	WWF38	162·400	GMZ800[1] GMZ850 GMZ870	28°50'·00N 82°29'·00W
Key West	WXJ95	162·400	GMZ005[1] GMZ032 GMZ033 GMZ034 GMZ035 GMZ043 GMZ044 GMZ053 GMZ054 GMZ055 GMZ073 GMZ074 GMZ075	24°39'·58N 81°31'·83W
Lake City	KEB97	162·400	GMZ755[2] GMZ775[2]	30°04'·20N 82°42'·60W
Largo	KEC38	162·450	GMZ800[1] GMZ830 GMZ850 GMZ853 GMZ870 GMZ873	27°50'·56N 82°48'·88W
Morriston	KWN38	162·550	GMZ800[1] GMZ850 GMZ870	29°15'·58N 82°34'·07W
Naples	WWG92	162·525	GMZ086[4] GMZ606[1] GMZ656 GMZ657 GMZ676	26°11'·00N 81°35'·00W
Panama City	KGC67	162·550	GMZ730 GMZ750 GMZ755 GMZ765 GMZ770 GMZ775	30°09'·94N 85°39'·24W
Pensacola	KEC86	162·400	GMZ600[1] GMZ633 GMZ650 GMZ655 GMZ670 GMZ675	30°35'·00N 87°04'·00W
Princeton	WNG663	162·425	GMZ031 GMZ042 GMZ052 GMZ072	25°23'·42N 80°28'·10W
Salem	WWF88	162·425	GMZ730 GMZ750 GMZ755 GMZ765 GMZ770 GMZ775	29°49'·20N 83°22'·20W
Sebring	WXK83A	162·500	GMZ800[1]	27°29'·40N 81°25'·80W
Tallahassee	KIH24	162·400	GMZ730 GMZ750 GMZ755 GMZ765 GMZ770 GMZ775	30°26'·00N 84°16'·00W
Tampa Bay	KHB32	162·550	GMZ800[1] GMZ830 GMZ850 GMZ853 GMZ870 GMZ873	27°50'·00N 82°16'·00W
Tea Table Key	WWG60	162·450	GMZ005[1] GMZ031 GMZ032 GMZ042 GMZ043 GMZ052 GMZ053 GMZ072 GMZ073	24°53'·57N 80°39'·53W
Venice	WWG59	162·400	GMZ800[1] GMZ836 GMZ853 GMZ856 GMZ873 GMZ876	27°08'·00N 82°24'·00W

LOUISIANA				
Baton Rouge	KHB46	162·400	GMZ530	30°26'·40N 91°10'·80W
Buras	WXL41	162·475	GMZ538 GMZ552 GMZ555	29°21'·35N 89°31'·93W
Lafayette	WXK80	162·550	GMZ400[1] GMZ435 GMZ452 GMZ455 GMZ472 GMZ475	30°03'·00N 92°00'·00W
Lake Charles	KHB42	162·400	GMZ400[1] GMZ432 GMZ450 GMZ452 GMZ455 GMZ470 GMZ472 GMZ475	30°13'·00N 93°19'·00W
Morgan City	KIH23	162·475	GMZ400[1] GMZ455 GMZ475 GMZ550 GMZ552	29°39'·00N 91°07'·00W
New Orleans	KHB43	162·550	GMZ530 GMZ532 GMZ534 GMZ536	29°57'·11N 90°04'·30W

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National Oceanic and Atmospheric Administration (NOAA) (Continued)

MISSISSIPPI				
Gulfport	KIH21	162·400	GMZ532 GMZ536 GMZ557	30°22'·65N 89°04'·77W

TEXAS				
Bay City	WWG40	162·425	GMZ300[1] GMZ330 GMZ350 GMZ370	28°59'·00N 95°58'·00W
Beaumont	WXK28	162·475	GMZ400[1] GMZ430 GMZ450	30°05'·00N 94°08'·00W
Brownsville	WWG34	162·550	GMZ100[1] GMZ130 GMZ132 GMZ135 GMZ150 GMZ155 GMZ170 GMZ175	25°54'·00N 97°30'·00W
Corpus Christi	KHB41	162·550	GMZ200[1] GMZ230 GMZ235 GMZ250 GMZ255 GMZ270 GMZ275	27°48'·00N 97°24'·00W
Galveston	KHB40	162·550	GMZ300[1] GMZ335 GMZ355 GMZ375 GMZ470	29°18'·00N 94°49'·00W
Houston	KGG68	162·400	GMZ300[1] GMZ335 GMZ355 GMZ375	29°46'·00N 95°22'·00W
Pharr	KHB33	162·400	GMZ100[1] GMZ130 GMZ132 GMZ135 GMZ150 GMZ155 GMZ170 GMZ175	26°09'·60N 98°11'·40W
Port O'Connor	WXL26	162·475	GMZ200[1] GMZ235 GMZ255 GMZ275	28°26'·47N 96°26'·60W
Riviera	WNG609	162·525	GMZ200[1] GMZ230 GMZ250 GMZ270	27°18'·00N 97°49'·00W
Victoria	WXK34	162·400	GMZ200[1] GMZ235 GMZ255 GMZ275	28°49'·00N 97°00'·00W

[1] Forecast synopsis.
[2] Routine forecasts only no warnings.
[3] Used for watch/warning purposes only and not routine broadcasts.
[4] Offshore forecast zone.

PACIFIC COAST CALIFORNIA				
Avalon	WNG584	162·525	PZZ655 PZZ775	33°21'·03N 118°21'·14W
Big Rock Ridge	KDX54	162·500	PZZ530 PZZ531 PZZ540 PZZ545 PZZ560	38°04'·00N 122°36'·00W
Eureka	KEC82	162·400	PZZ410 PZZ450 PZZ455 PZZ470 PZZ475	40°25'·00N 124°07'·00W
Monterey	KEC49	162·550	PZZ500[1] PZZ530 PZZ531 PZZ535 PZZ560	37°09'·00N 121°54'·00W
Monterey Marine	WWF64	162·450	PZZ500[1] PZZ530 PZZ531 PZZ535 PZZ540 PZZ545 PZZ560 PZZ565 PZZ570 PZZ571 PZZ575 PZZ576	37°09'·00N 121°54'·00W
Point Arena	KIH30	162·550	PZZ455 PZZ475 PZZ540 PZZ570	39°01'·00N 123°31'·00W
San Diego	KEC62	162·400	PZZ700[1] PZZ750 PZZ775	33°01'·00N 116°58'·00W
San Diego Marine	WNG637	162·425	PZZ700[1] PZZ750 PZZ775	32°50'·27N 117°15'·00W
San Francisco	KHB49	162·400	PZZ500[1] PZZ530 PZZ531 PZZ540 PZZ545	37°27'·00N 122°20'·00W
San Simeon	WNG592	162·525	PZZ645 PZZ670	35°41'·00N 121°10'·00W
Santa Ana	WWG21	162·450	PZZ655 PZZ676 PZZ700[1] PZZ750 PZZ775	33°49'·00N 117°38'·00W
Santa Barbara Marine	WWF62	162·475	PZZ645 PZZ650 PZZ670 PZZ673 PZZ676	34°31'·49N 119°57'·51W
Sonoma County	WZ2504	162·475	PZZ500[1] PZZ530 PZZ531 PZZ540 PZZ545	38°21'·00N 122°36'·00W

OREGON				
Astoria	KEC91	162·400	PZZ156[5] PZZ176[5] PZZ210 PZZ250 PZZ255 PZZ270 PZZ275	46°16'·00N 123°53'·00W
Brookings	KIH37	162·550	PZZ356 PZZ370 PZZ376 PZZ450 PZZ470	42°08'·00N 124°13'·00W
Cape Blanco	WNG596	162·425	PZZ300[1] PZZ350 PZZ356 PZZ370 PZZ376 PZZ450	42°50'·21N 124°33'·49W
Coos Bay	KIH32	162·400	PZZ255 PZZ275 PZZ300[1] PZZ350 PZZ356 PZZ370 PZZ376	43°25'·94N 124°12'·62W
Florence	WNG674	162·500	PZZ210 PZZ250 PZZ255 PZZ270 PZZ275 PZZ350[5] PZZ370[5]	44°07'·00N 124°01'·00W
Mt Hebo	WNG697	162·525	PZZ156[5] PZZ176[5] PZZ210 PZZ250 PZZ255 PZZ270 PZZ275	45°12'·81N 123°45'·92W
Neahaknie	WWF94	162·425	PZZ156[5] PZZ176[5] PZZ210 PZZ250 PZZ255 PZZ270 PZZ275	45°45'·00N 123°57'·00W
Newport	KIH33	162·550	PZZ210 PZZ250 PZZ255 PZZ270 PZZ275 PZZ350[5] PZZ370[5]	44°45'·41N 124°02'·51W
Tillamook	WWF95	162·475	PZZ156[5] PZZ176[5] PZZ210 PZZ250 PZZ255 PZZ270 PZZ275	45°28'·00N 123°55'·00W

Continued on next page

UNITED STATES

National Oceanic and Atmospheric Administration (NOAA) (Continued)

WASHINGTON				
Capitol Peak	WXM62	162·475	PZZ135 PZZ150 PZZ153 PZZ156 PZZ170 PZZ173 PZZ176	46°58'·00N 123°08'·00W
Forks/Olympic National Park	KXI27	162·425	PZZ100[1] PZZ110 PZZ130 PZZ131 PZZ132 PZZ150 PZZ153 PZZ156 PZZ170 PZZ173 PZZ176 PZZ800[2]	47°45'·00N 124°11'·00W
Puget Sound Marine	WWG24	162·425	PZZ100[1] PZZ130 PZZ131 PZZ132 PZZ133 PZZ134 PZZ135 PZZ150 PZZ153 PZZ156 PZZ170 PZZ173 PZZ176	48°00'·38N 122°58'·00W
Neah Bay	KIH36	162·550	PZZ100[1] PZZ110 PZZ130 PZZ131 PZZ132 PZZ150 PZZ153 PZZ156 PZZ170 PZZ173 PZZ176 PZZ800[2]	48°22'·00N 124°40'·00W
Seattle	KHB60	162·550	PZZ135	47°32'·00N 122°06'·00W

[1] Forecast synopsis.
[2] Offshore forecast zone.
[3] July–November.
[4] June–November.
[5] Routine forecasts only, no warnings.

PACIFIC ISLANDS AMERICAN SAMOA				
Pago Pago	WNG710	162·400	PSZ100[1] PSZ150 PSZ151 PSZ152	15°11'·00N 145°44'·00E

GUAM				
Guam	WXM85	162·400	PMZ150[1] PMZ151 PMZ152	13°25'·98N 144°42'·76E

HAWAII				
Hawaii (Kulani Cone)	WWG76	162·550	PHZ100[1] PHZ122 PHZ123 PHZ124	19°33'·00N 155°19'·00W
Hawaii (Oahu) Kai	WWF39	162·400	PHZ100[1] PHZ110 PHZ111 PHZ112 PHZ113 PHZ114 PHZ115 PHZ116 PHZ117 PHZ118 PHZ119 PHZ120 PHZ121 PHZ122 PHZ123	21°19'·25N 157°40'·93W
Hawaii (South Point)	WWG27	162·550	PHZ100[1] PHZ122 PHZ123	18°56'·63N 155°41'·15W
Kauai (Kokee)	WWG74	162·400	PHZ100[1] PHZ110 PHZ111 PHZ112 PHZ113 PHZ114 PHZ115 PHZ116 PHZ117 PHZ118 PHZ119 PHZ120 PHZ121 PHZ122 PHZ123	22°08'·82N 159°38'·68W
Maui (Mt Haleakala)	WWG75	162·400	PHZ100[1] PHZ110 PHZ111 PHZ112 PHZ113 PHZ114 PHZ115 PHZ116 PHZ117 PHZ118 PHZ119 PHZ120 PHZ121 PHZ122 PHZ123	20°44'·00N 156°16'·00W
Oahu (Mt. Kaala)	KBA99	162·550	PHZ100[1] PHZ110 PHZ111 PHZ112 PHZ113 PHZ114 PHZ115 PHZ116 PHZ117 PHZ118 PHZ119 PHZ120 PHZ121 PHZ122 PHZ123	21°30'·46N 158°08'·56W

NORTHERN MARIANA ISLANDS				
Saipan	WXM86	162·550	PMZ153 PMZ154	15°11'·00N 145°44'·00E

[1] Forecast synopsis.

FORT COLLINS, COLORADO (WWV)				
Control Centre: 40°40′·82N 105°02′·45W				
	2500 kHz	AM	Site 1	40°40′·92N 105°02′·52W
	5000 kHz		Site 2	40°40′·70N 105°02′·42E
	10000 kHz		Site 3	40°40′·80N 105°02′·42E
	15000 kHz		Site 4	40°40′·89N 105°02′·48E
Navigational Warnings				
H+08 and H+09	Atlantic high seas storm warnings.			
H+10	Pacific high seas storm warnings.			

UNITED STATES (Alaska)

GENERAL NOTES

NOAA Continuous VHF Weather Broadcasts

Diagrams pages 233, 234, 235 and 236

For complete details of the NOAA's operations and services, please see the note under the United States of America Geographic Area, specifically under subheading **NOAA WEATHER RADIO (NWR)**.

Alaska Weather Information Line

The Alaska Weather Information Line provides toll- free telephone weather information for Alaska. This service is available outside Alaska but is not toll-free. Weather forecasts are issued on a regular basis, updated when required and either recorded by NWS staff or automated by a NWS text to speech system.

- **Marine Forecasts** are available for all coastal marine areas with outlook for 5 days.
- **Observations** from certain land stations and marine buoys are available, this information is updated once per hour.

The menu system is organised according to geographical area: Northern, Southwestern, South Central and Southeastern.

For forecasts and observations telephone:

In Anchorage: 2665145
In Fairbanks: 4583745
In Juneau: 7906850
Elsewhere in Alaska: +1 800 4720391
Outside Alaska: +1 907 2665145

Weather Service Offices (WSOs)

The National Weather Service (NWS) Alaska Region WSOs provide voice weather broadcasts and receive marine weather observations on 4125 kHz and marine VHF channels. Radios are monitored during hours when WSOs are open and personnel are available as follows:

National Weather Service (NWS) Points of Contact

Issued marine weather forecasts and warnings may be obtained through:

(a) **Telephone:** (For International dialling add code: +1 907)

(i) **Recorded Telephone Marine Forecasts**
Cordova: 4243333 (H24)
Juneau: 5863997 (H24)
Sitka: 7476011 (H24)
Wrangell: 8743232 (H24)
Yakutat: 7843654 (H24)

(ii) **WSO Telephone Numbers**
Anchorage: 2665102
Fairbanks: 4583700
Juneau: 7906802

(b) **Website:** Weather information, including forecasts, warnings, statements, climatological data and observations is available at: www.arh.noaa.gov

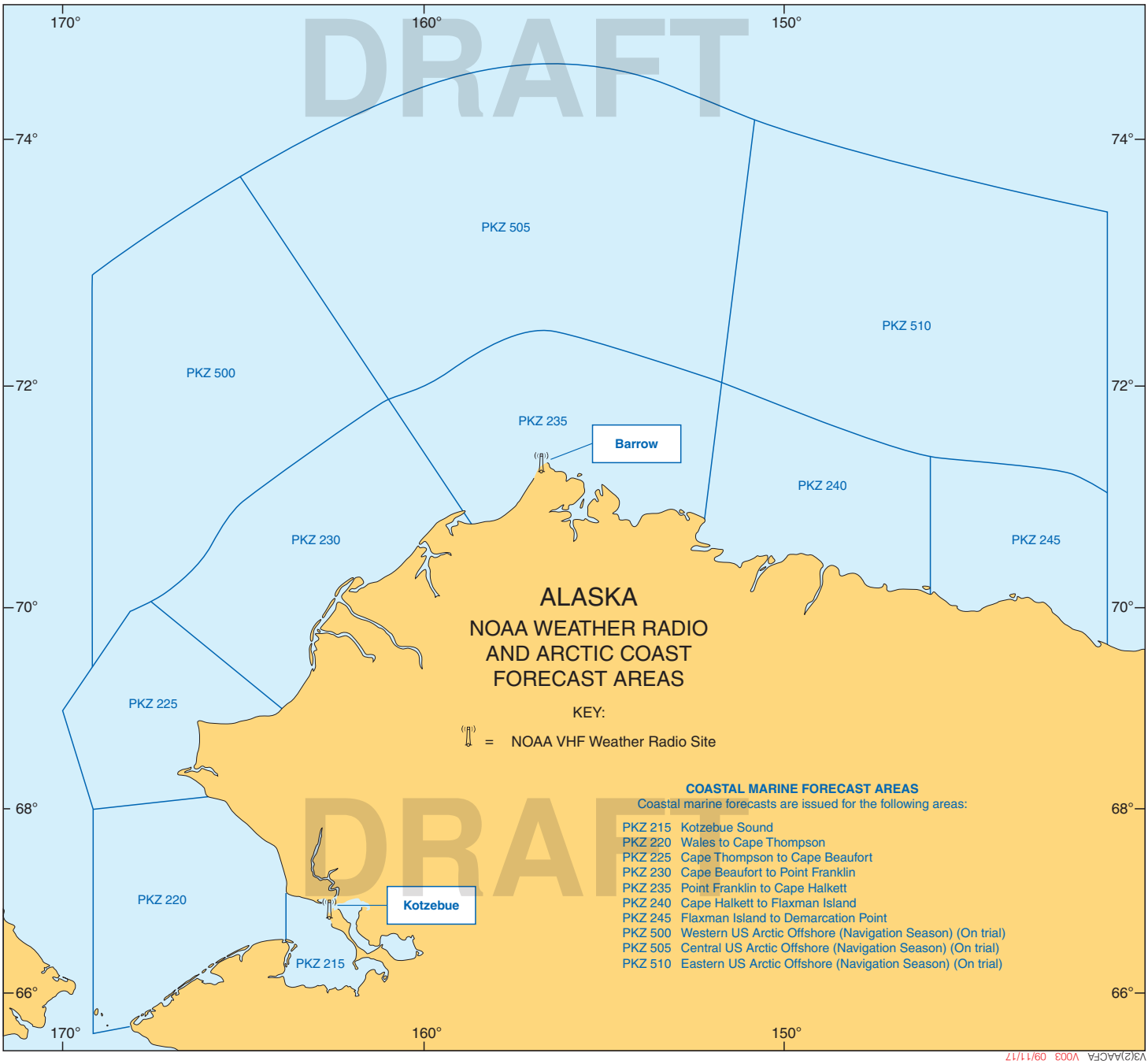
Alaska Ice Forecasting Services

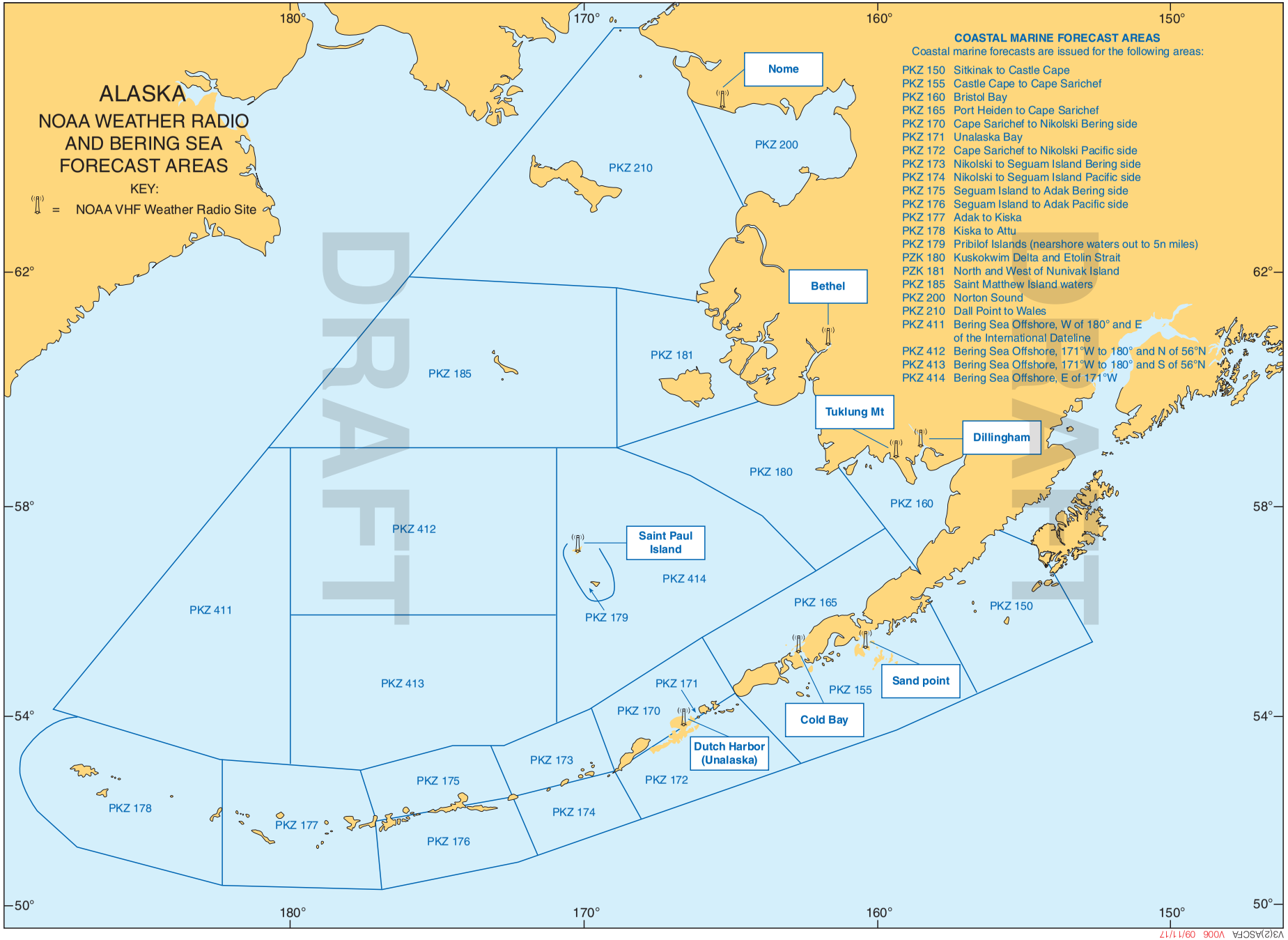
The NWS Weather Forecasting Office in Anchorage has expanded its ice forecasting services to seven days a week. Forecasts will be produced according to the table below. Users do not need to make any changes to their systems to continue receiving the previous products. In addition, the Full Colour Sea Ice Analysis has gained a WMO Header, in order to make it retrievable through automatic systems. This product will still be available in its current format on the internet at http://pafc.arh.noaa.gov/ice.php

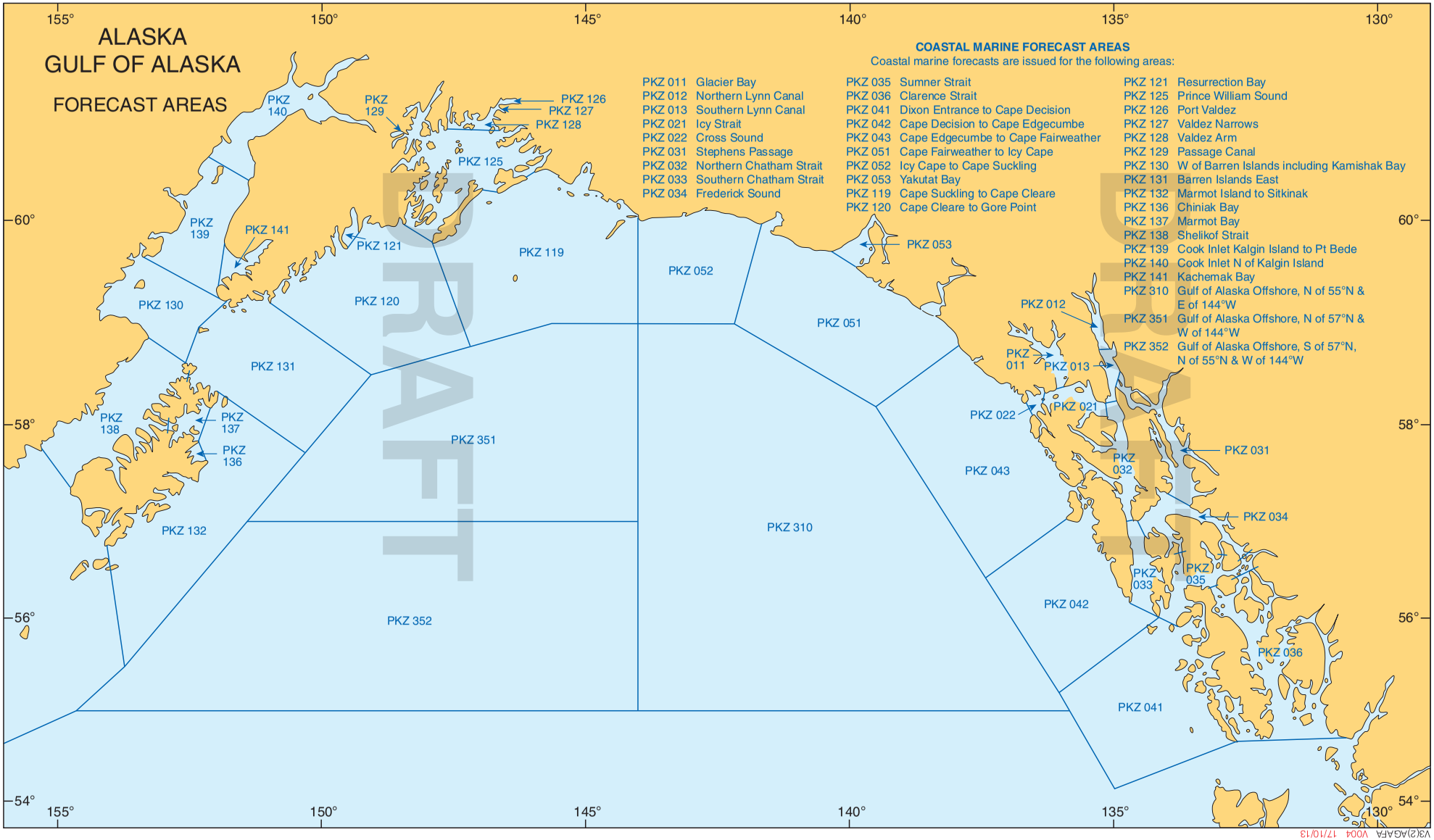
Anchorage Ice Forecasting Schedule	
Product	**Issue Day**
Sea Ice Advisory for Western and Arctic Alaskan Coastal Waters (text)	Mon, Wed, Fri
Sea Ice Outlook for Western and Arctic Alaskan Coastal Waters (text)	4th Thurs of each month
Alaskan Sea Ice Analysis (graphic)	Daily
Alaskan Five Day Sea Ice Forecast (graphic)	Mon, Wed, Fri
Cook Inlet Ice Analysis (graphic seasonal)	Daily
Sea Surface Temperature Analysis (graphic)	Daily
Full Colour Sea Ice Analysis (graphic)	Daily

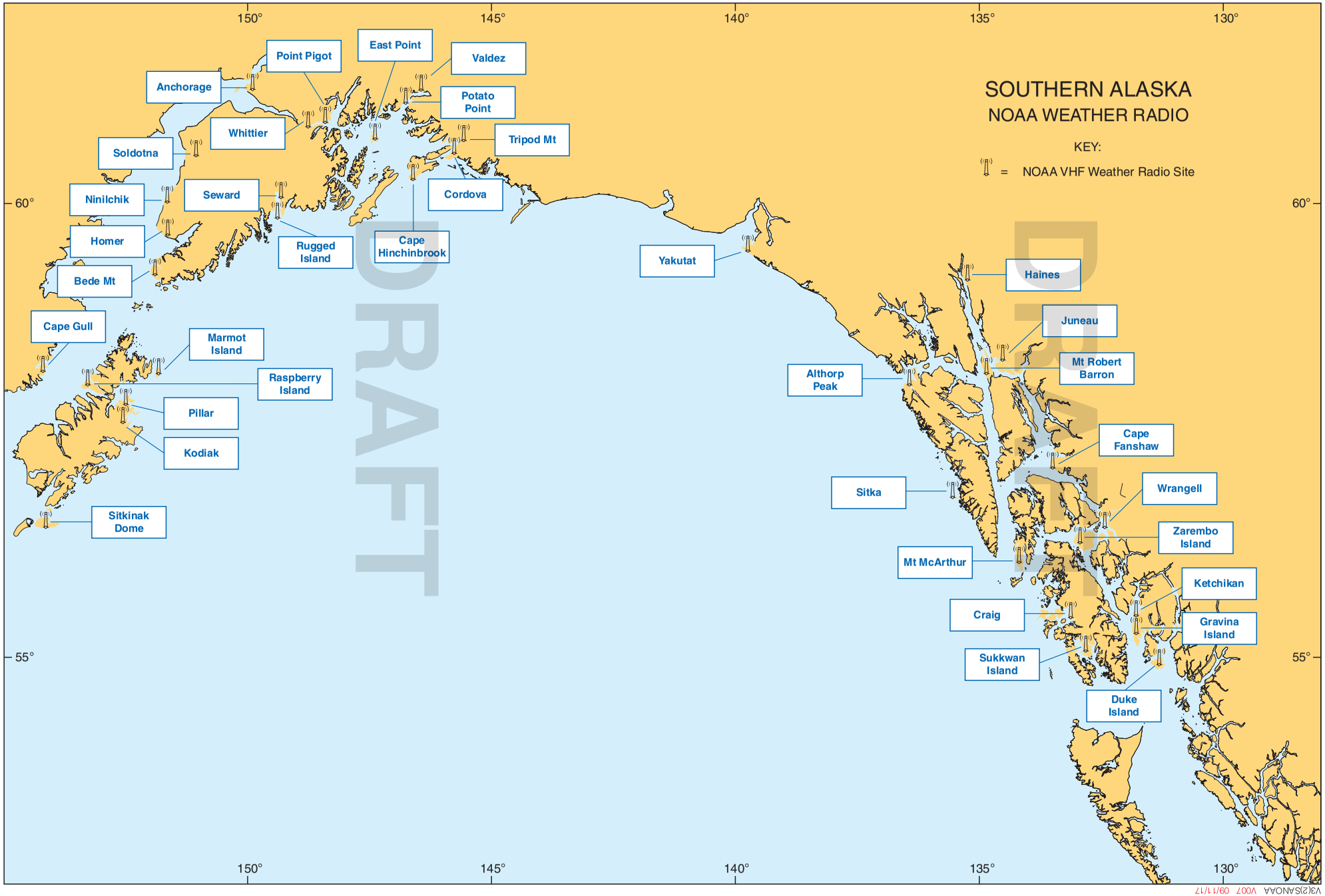
INTERNET WEATHER SERVICES

NOAA National Weather Service: Alaska www.weather.gov/arh	Marine forecasts and tidal information.


DRAFT
170°
160°
150°
74°
72°
70°
68°
66°
PKZ 505
PKZ 510
PKZ 500
PKZ 235
Barrow
PKZ 240
PKZ 230
PKZ 245
PKZ 225
PKZ 220
Kotzebue
PKZ 215
ALASKA
NOAA WEATHER RADIO
AND ARCTIC COAST
FORECAST AREAS
KEY:
= NOAA VHF Weather Radio Site
COASTAL MARINE FORECAST AREAS
Coastal marine forecasts are issued for the following areas:
PKZ 215 Kotzebue Sound
PKZ 220 Wales to Cape Thompson
PKZ 225 Cape Thompson to Cape Beaufort
PKZ 230 Cape Beaufort to Point Franklin
PKZ 235 Point Franklin to Cape Halkett
PKZ 240 Cape Halkett to Flaxman Island
PKZ 245 Flaxman Island to Demarcation Point
PKZ 500 Western US Arctic Offshore (Navigation Season) (On trial)
PKZ 505 Central US Arctic Offshore (Navigation Season) (On trial)
PKZ 510 Eastern US Arctic Offshore (Navigation Season) (On trial)


ALASKA
NOAA WEATHER RADIO AND BERING SEA FORECAST AREAS
KEY:
= NOAA VHF Weather Radio Site
COASTAL MARINE FORECAST AREAS
Coastal marine forecasts are issued for the following areas:
PKZ 150 Sitkinak to Castle Cape
PKZ 155 Castle Cape to Cape Sarichef
PKZ 160 Bristol Bay
PKZ 165 Port Heiden to Cape Sarichef
PKZ 170 Cape Sarichef to Nikolski Bering side
PKZ 171 Unalaska Bay
PKZ 172 Cape Sarichef to Nikolski Pacific side
PKZ 173 Nikolski to Seguam Island Bering side
PKZ 174 Nikolski to Seguam Island Pacific side
PKZ 175 Seguam Island to Adak Bering side
PKZ 176 Seguam Island to Adak Pacific side
PKZ 177 Adak to Kiska
PKZ 178 Kiska to Attu
PKZ 179 Pribilof Islands (nearshore waters out to 5n miles)
PZK 180 Kuskokwim Delta and Etolin Strait
PZK 181 North and West of Nunivak Island
PKZ 185 Saint Matthew Island waters
PKZ 200 Norton Sound
PKZ 210 Dall Point to Wales
PKZ 411 Bering Sea Offshore, W of 180° and E of the International Dateline
PKZ 412 Bering Sea Offshore, 171°W to 180° and N of 56°N
PKZ 413 Bering Sea Offshore, 171°W to 180° and S of 56°N
PKZ 414 Bering Sea Offshore, E of 171°W
Nome
Bethel
Tuklung Mt
Dillingham
Saint Paul Island
Dutch Harbor (Unalaska)
Cold Bay
Sand point
PKZ 200
PKZ 210
PKZ 181
PKZ 185
PKZ 180
PKZ 160
PKZ 412
PKZ 414
PKZ 411
PKZ 179
PKZ 165
PKZ 150
PKZ 413
PKZ 171
PKZ 155
PKZ 170
PKZ 173
PKZ 172
PKZ 175
PKZ 174
PKZ 178
PKZ 177
PKZ 176
180°
170°
160°
150°
62°
58°
54°
50°
DRAFT


ALASKA
GULF OF ALASKA
FORECAST AREAS
COASTAL MARINE FORECAST AREAS
Coastal marine forecasts are issued for the following areas:
PKZ 011 Glacier Bay
PKZ 012 Northern Lynn Canal
PKZ 013 Southern Lynn Canal
PKZ 021 Icy Strait
PKZ 022 Cross Sound
PKZ 031 Stephens Passage
PKZ 032 Northern Chatham Strait
PKZ 033 Southern Chatham Strait
PKZ 034 Frederick Sound
PKZ 035 Sumner Strait
PKZ 036 Clarence Strait
PKZ 041 Dixon Entrance to Cape Decision
PKZ 042 Cape Decision to Cape Edgecumbe
PKZ 043 Cape Edgecumbe to Cape Fairweather
PKZ 051 Cape Fairweather to Icy Cape
PKZ 052 Icy Cape to Cape Suckling
PKZ 053 Yakutat Bay
PKZ 119 Cape Suckling to Cape Cleare
PKZ 120 Cape Cleare to Gore Point
PKZ 121 Resurrection Bay
PKZ 125 Prince William Sound
PKZ 126 Port Valdez
PKZ 127 Valdez Narrows
PKZ 128 Valdez Arm
PKZ 129 Passage Canal
PKZ 130 W of Barren Islands including Kamishak Bay
PKZ 131 Barren Islands East
PKZ 132 Marmot Island to Sitkinak
PKZ 136 Chiniak Bay
PKZ 137 Marmot Bay
PKZ 138 Shelikof Strait
PKZ 139 Cook Inlet Kalgin Island to Pt Bede
PKZ 140 Cook Inlet N of Kalgin Island
PKZ 141 Kachemak Bay
PKZ 310 Gulf of Alaska Offshore, N of 55°N & E of 144°W
PKZ 351 Gulf of Alaska Offshore, N of 57°N & W of 144°W
PKZ 352 Gulf of Alaska Offshore, S of 57°N, N of 55°N & W of 144°W
155°
150°
145°
140°
135°
130°
60°
58°
56°
54°
DRAFT
V3(2)AGAFA V004 17/10/13


SOUTHERN ALASKA
NOAA WEATHER RADIO
KEY:
= NOAA VHF Weather Radio Site
150°
145°
140°
135°
130°
60°
55°
Point Pigot
East Point
Valdez
Anchorage
Potato Point
Whittier
Tripod Mt
Soldotna
Seward
Cordova
Ninilchik
Homer
Rugged Island
Cape Hinchinbrook
Bede Mt
Yakutat
Haines
Cape Gull
Juneau
Marmot Island
Mt Robert Barron
Raspberry Island
Althorp Peak
Pillar
Cape Fanshaw
Kodiak
Sitka
Wrangell
Sitkinak Dome
Zarembo Island
Mt McArthur
Ketchikan
Craig
Gravina Island
Sukkwan Island
Duke Island
DRAFT
V3(2)SANOAA V007 09/11/17

UNITED STATES (Alaska)

NAVTEX			
J X	Kodiak	518 kHz	57°46′·63N 152°31′·72W
Diagrams pages 39, 233, 234, 235 and 236			
Weather Bulletins			
J: 0130 0530 1330 1730	Weather forecast for Sea Areas east of Kodiak.		
X: 0350 0750 1550 1950	Weather forecast for Sea Areas west of Kodiak.		
Navigational Warnings			
J: 0130 0530 0930 1330 1730 2130	Weather and Navigational Warnings for Sea Areas east of Kodiak.		
X: 0350 0750 1150 1550 1950 2350	Weather and Navigational Warnings for Sea Areas west of Kodiak.		

ANCHORAGE SECTOR (US COAST GUARD) (NOJ3)				
Control Centre: 61°13′·03N 149°54′·24W				
	Ch 22A	VHF		
Diagrams pages 235 and 236				
Navigational Warnings				
On receipt	Gale warnings and local Navigational Warnings.			

JUNEAU SECTOR (US COAST GUARD) (NMJ)				
Control Centre: 58°18′·07N 134°25′·20W				
	Ch 22A	VHF		
Diagrams pages 235 and 236				
Navigational Warnings				
On receipt	Gale warnings and local Navigational Warnings.			

KODIAK (US COAST GUARD) (NOJ)				
Control Centre: 57°46′·63N 152°31′·72W				
	6501 *(Ch 601)*	RT (HF)		
Diagrams pages 235, 236 and 266				
Weather Bulletins				
0203 1645	Coastal and offshore forecast for Gulf of Alaska and Bering Sea.			
Navigational Warnings				
0203 1645	Navigational warnings, including storm warnings, ice reports (during the season) and tsunami watch/warning for Alaska and west coast of United States.			

UNITED STATES (Atlantic Coast)

NAVTEX			
F	Boston	518 kHz	41°42′·82N 70°30′·27W
E	Charleston		32°50′·67N 79°57′·00W
A	Miami		25°37′·40N 80°23′·37W
N	Portsmouth (COMMCOM)		36°43′·72N 76°00′·60W
Diagrams pages 39, 239, 240, 241, 242, 243 and 244			
Weather Bulletins			
F: 0050 0450 1250 1650	Weather forecast.		
E: 0040 0440 1240 1640			
A: 0000 0400 1200 1600			
N: 0610 1010 1810 2210			

Continued overleaf

UNITED STATES (Atlantic Coast)

NAVTEX (Continued)

Navigational Warnings	
F: 0050 0450 1250 1650	Weather and Navigational Warnings.
E: 0040 0440 1240 1640	
A: 0000 0400 1200 1600	
F: 0850 2050	Repeated Navigational Warnings.
E: 0840 2040	
A: 0800 2000	
N: 1010 2210	
E: On receipt	Right Whale shoal warnings.
N: 0210 0610 1410 1810	Navigational Warnings.
Ice Warnings and Reports	
F: 0050 0450 0850 1250 1650 2050 (Feb-July approx)	International Ice Patrol Bulletin

FIRING PRACTICE AREA - JOINT EXPEDITIONARY BASE LITTLE CREEK, FORT STORY

Approximate Position: 36°56′·00N 76°08′·00W

Live firing is conducted continuously, Mon–Fri from 0700–2000 LT, in the Danger Zone 334.370 located west of the south end of the Chesapeake Bay Bridge Tunnel. Further information can obtained from Range Operatons Control by telephone on: +1 757 4427103 or 4427101.

FIRING PRACTICE AREA - NEW RIVER FIRING RANGE

Approximate Position: 34°30′·00N 77°10′·00W

Firing exercises take place in the area between a point approximately 4·5 n miles east of Bogue Inlet and a point approximately 10 n miles southwest of New River Inlet, within the existing danger zone. Firing will be up to 15 n miles seaward. Vessels are urged to avoid the area during firing exercises. Range control boats monitor VHF Ch 16 and working Ch 82. Range control boats can be reached by phone at +1 910 4513064 or 4449.

BOSTON RCF (US COAST GUARD FIRST DISTRICT) (NMF)

Control Centre: 42°21′·32N 71°03′·05W

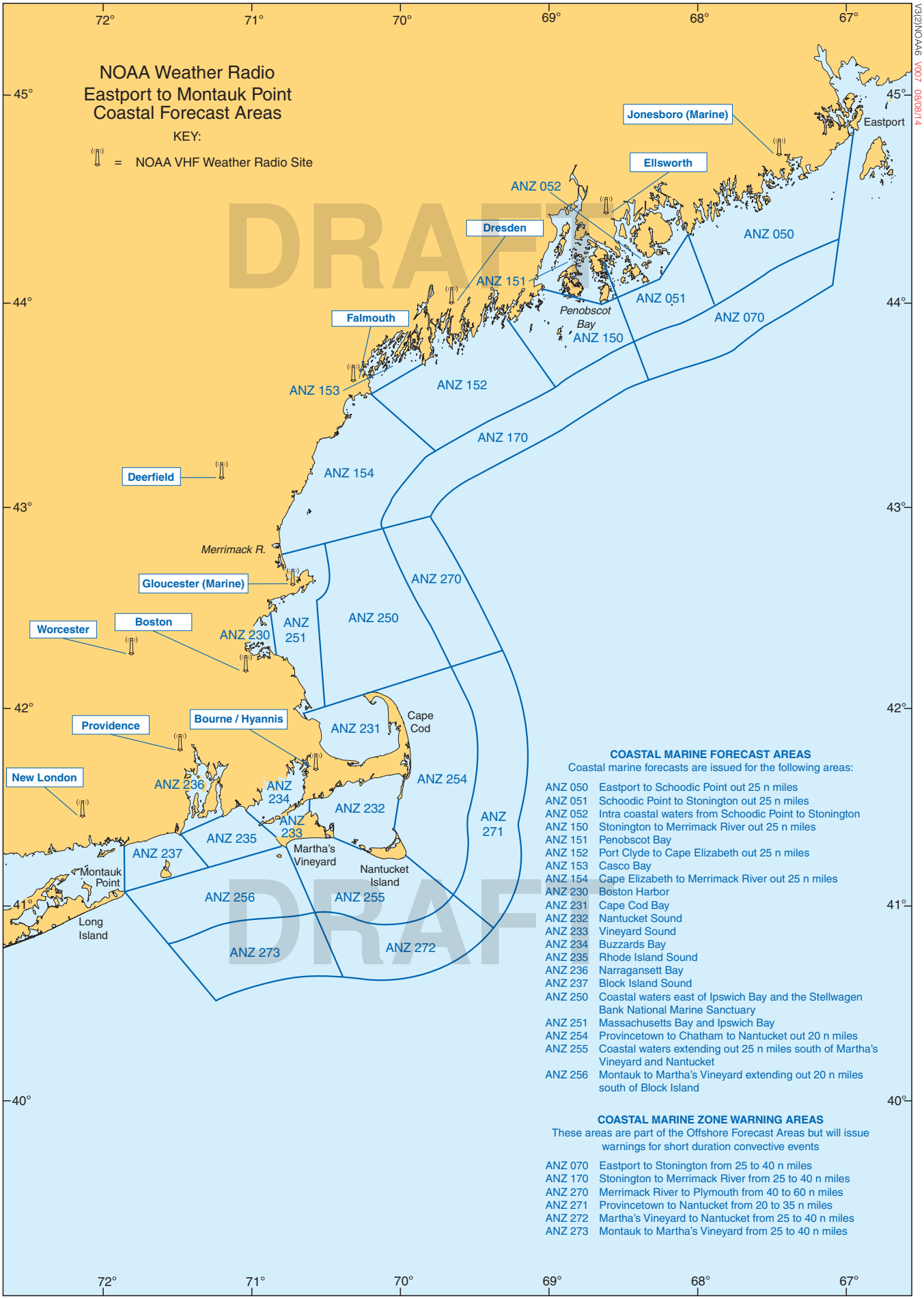
A	6314	RADIO-TELEX	Boston (HF Aerial)	41°42′·00N 70°30′·00W
B	8416·5			
C	12579			
D	16806·5			

Diagrams pages 244, 251, 265 and 266

Weather Bulletins	
A: 0140 **B, C:** 0140 1630 **D:** 1630	24 hour forecast for North Atlantic, W of 35°W, including the Caribbean Sea and Gulf of Mexico.
Navigational Warnings	
A: 0140 **B, C:** 0140 1630 **D:** 1630	Gale warnings for North Atlantic, W of 35°W, including the Caribbean Sea and Gulf of Mexico. NAVAREA IV warnings are broadcast at two successive scheduled times. Numbers of all warnings broadcast during the previous 6 weeks and still in force, are broadcast each Wednesday.
A[1]**:** 0140 **B**[1]**, C**[1]**:** 0140 1630 **D**[1]**:** 1630	International Ice Patrol Bulletin. Ice chart available on request.

[1] Feb–Sep approx

NOTE(S): 1. The carrier frequency for Radio-Telex transmissions are 1·7 kHz below the assigned frequency shown.
2. HF broadcasts remotely controlled from COMMCOM.



COASTAL MARINE FORECAST AREAS

Coastal marine forecasts are issued for the following areas:

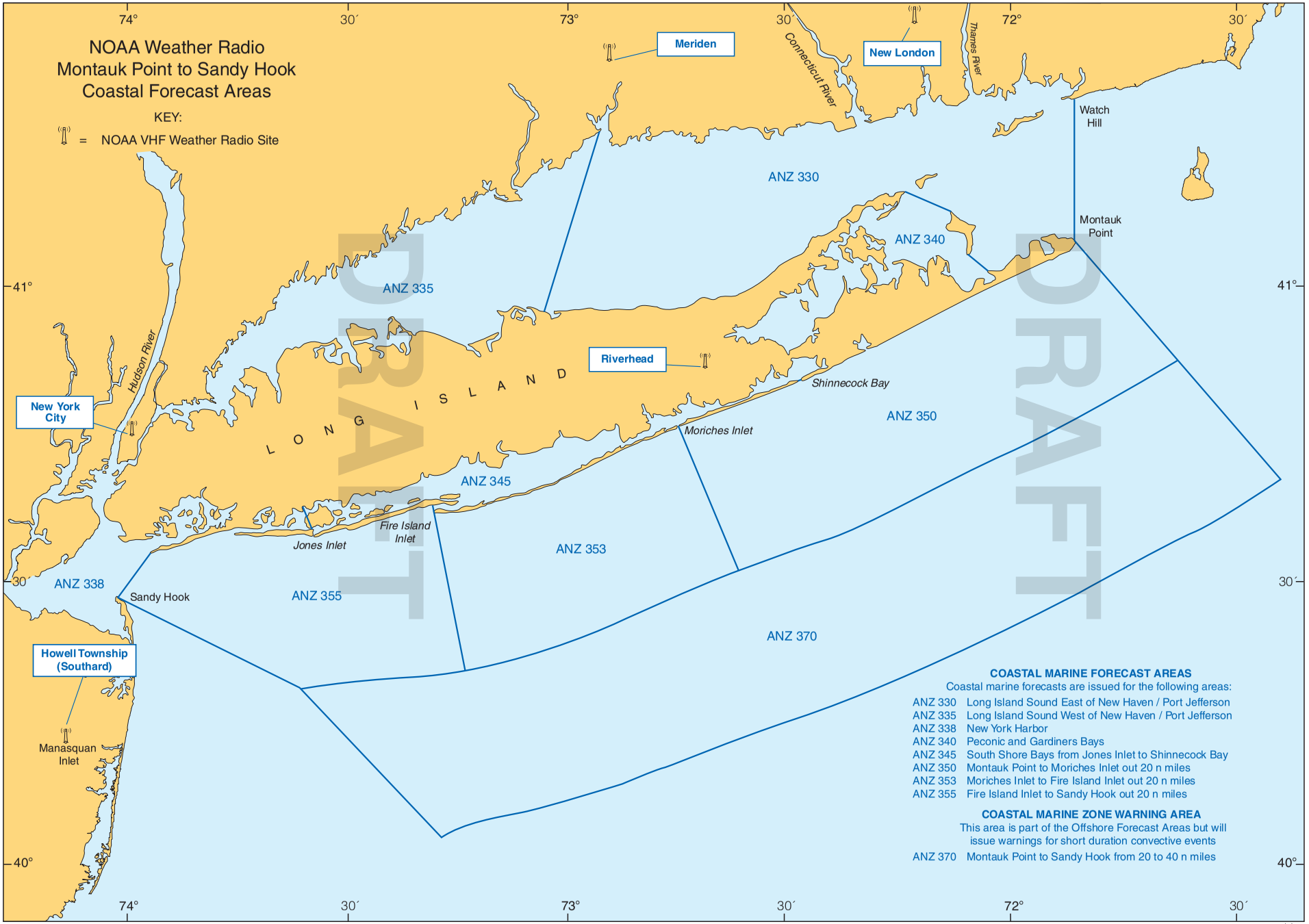
ANZ 050	Eastport to Schoodic Point out 25 n miles
ANZ 051	Schoodic Point to Stonington out 25 n miles
ANZ 052	Intra coastal waters from Schoodic Point to Stonington
ANZ 150	Stonington to Merrimack River out 25 n miles
ANZ 151	Penobscot Bay
ANZ 152	Port Clyde to Cape Elizabeth out 25 n miles
ANZ 153	Casco Bay
ANZ 154	Cape Elizabeth to Merrimack River out 25 n miles
ANZ 230	Boston Harbor
ANZ 231	Cape Cod Bay
ANZ 232	Nantucket Sound
ANZ 233	Vineyard Sound
ANZ 234	Buzzards Bay
ANZ 235	Rhode Island Sound
ANZ 236	Narragansett Bay
ANZ 237	Block Island Sound
ANZ 250	Coastal waters east of Ipswich Bay and the Stellwagen Bank National Marine Sanctuary
ANZ 251	Massachusetts Bay and Ipswich Bay
ANZ 254	Provincetown to Chatham to Nantucket out 20 n miles
ANZ 255	Coastal waters extending out 25 n miles south of Martha's Vineyard and Nantucket
ANZ 256	Montauk to Martha's Vineyard extending out 20 n miles south of Block Island

COASTAL MARINE ZONE WARNING AREAS

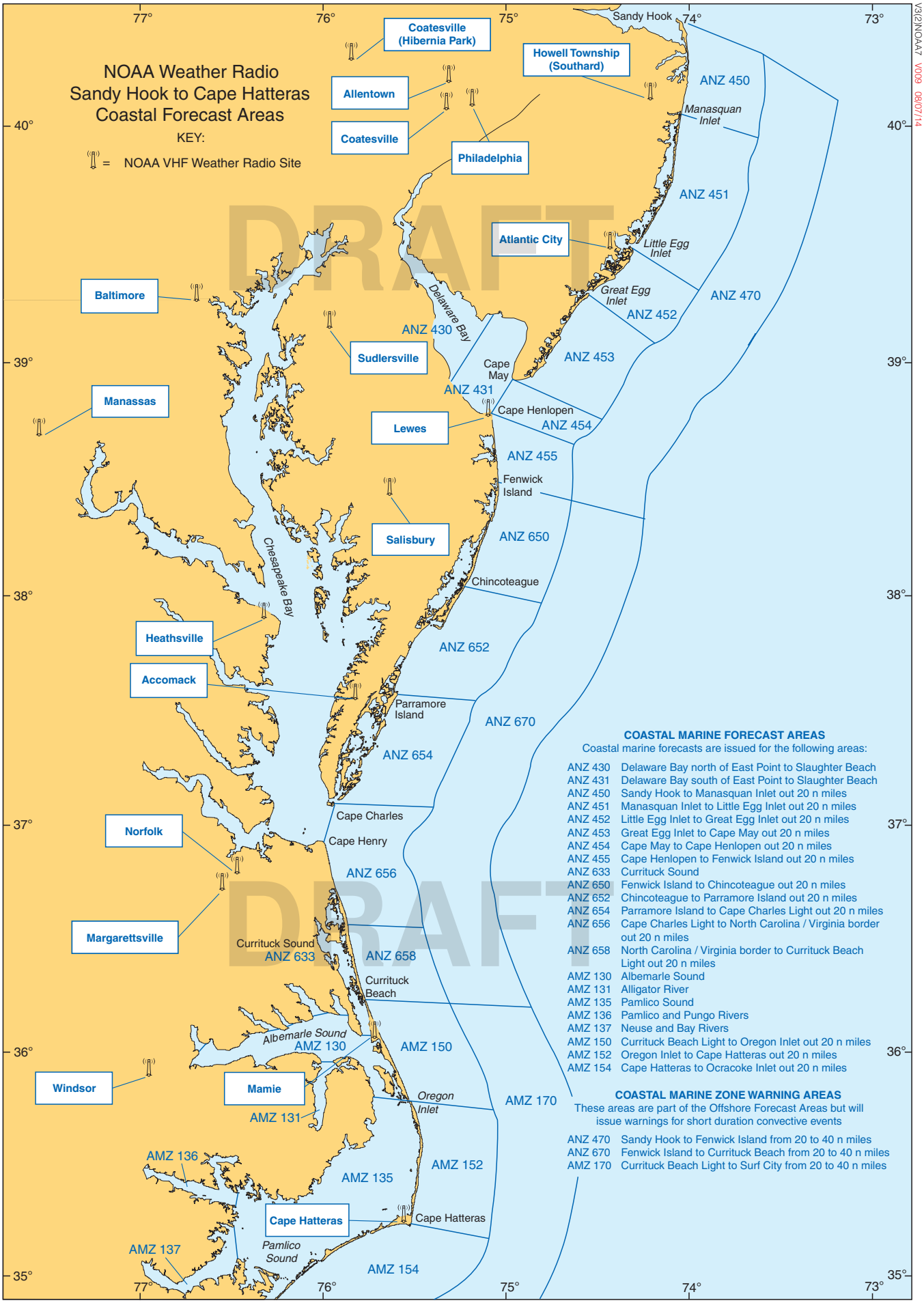
These areas are part of the Offshore Forecast Areas but will issue warnings for short duration convective events

ANZ 070	Eastport to Stonington from 25 to 40 n miles
ANZ 170	Stonington to Merrimack River from 25 to 40 n miles
ANZ 270	Merrimack River to Plymouth from 40 to 60 n miles
ANZ 271	Provincetown to Nantucket from 20 to 35 n miles
ANZ 272	Martha's Vineyard to Nantucket from 25 to 40 n miles
ANZ 273	Montauk to Martha's Vineyard from 25 to 40 n miles

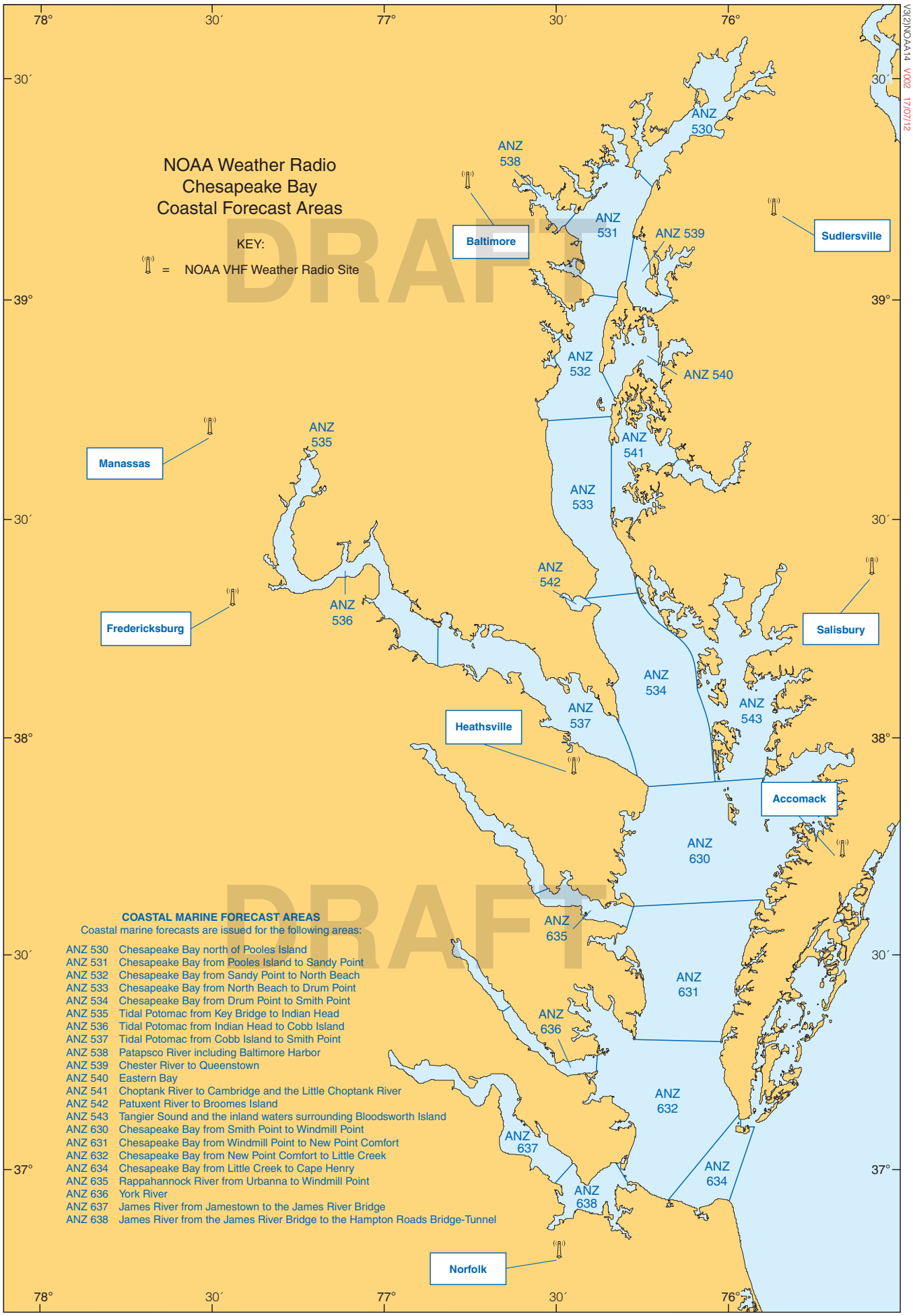
V3(2)NOAA6 V007 08/08/14



V3(2)NOAA8 V007 08/08/14



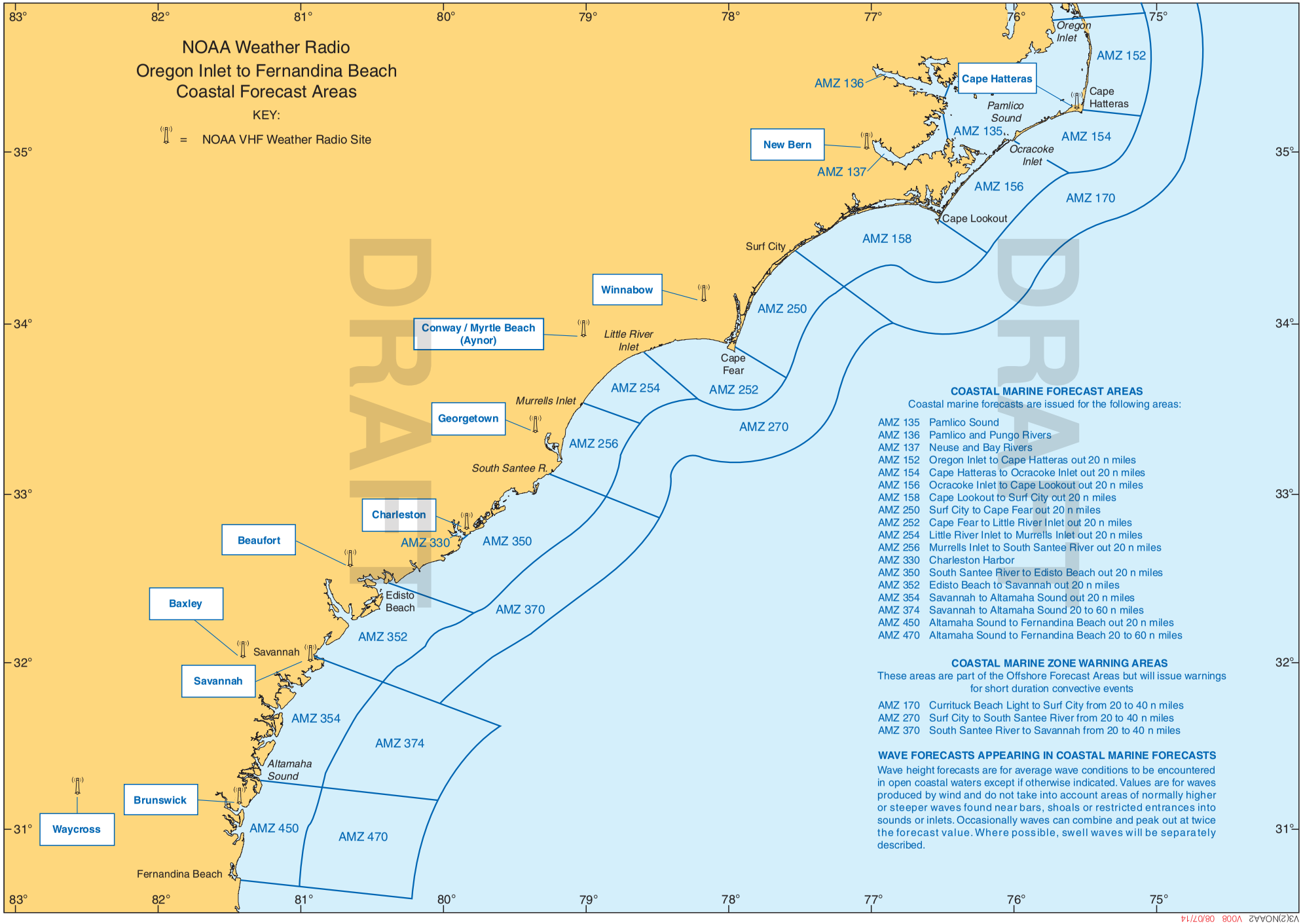
V3(2)NOAA7 V009 08/07/14



COASTAL MARINE FORECAST AREAS

Coastal marine forecasts are issued for the following areas:

ANZ 530	Chesapeake Bay north of Pooles Island
ANZ 531	Chesapeake Bay from Pooles Island to Sandy Point
ANZ 532	Chesapeake Bay from Sandy Point to North Beach
ANZ 533	Chesapeake Bay from North Beach to Drum Point
ANZ 534	Chesapeake Bay from Drum Point to Smith Point
ANZ 535	Tidal Potomac from Key Bridge to Indian Head
ANZ 536	Tidal Potomac from Indian Head to Cobb Island
ANZ 537	Tidal Potomac from Cobb Island to Smith Point
ANZ 538	Patapsco River including Baltimore Harbor
ANZ 539	Chester River to Queenstown
ANZ 540	Eastern Bay
ANZ 541	Choptank River to Cambridge and the Little Choptank River
ANZ 542	Patuxent River to Broomes Island
ANZ 543	Tangier Sound and the inland waters surrounding Bloodsworth Island
ANZ 630	Chesapeake Bay from Smith Point to Windmill Point
ANZ 631	Chesapeake Bay from Windmill Point to New Point Comfort
ANZ 632	Chesapeake Bay from New Point Comfort to Little Creek
ANZ 634	Chesapeake Bay from Little Creek to Cape Henry
ANZ 635	Rappahannock River from Urbanna to Windmill Point
ANZ 636	York River
ANZ 637	James River from Jamestown to the James River Bridge
ANZ 638	James River from the James River Bridge to the Hampton Roads Bridge-Tunnel



COASTAL MARINE FORECAST AREAS

Coastal marine forecasts are issued for the following areas:

AMZ 135 Pamlico Sound
AMZ 136 Pamlico and Pungo Rivers
AMZ 137 Neuse and Bay Rivers
AMZ 152 Oregon Inlet to Cape Hatteras out 20 n miles
AMZ 154 Cape Hatteras to Ocracoke Inlet out 20 n miles
AMZ 156 Ocracoke Inlet to Cape Lookout out 20 n miles
AMZ 158 Cape Lookout to Surf City out 20 n miles
AMZ 250 Surf City to Cape Fear out 20 n miles
AMZ 252 Cape Fear to Little River Inlet out 20 n miles
AMZ 254 Little River Inlet to Murrells Inlet out 20 n miles
AMZ 256 Murrells Inlet to South Santee River out 20 n miles
AMZ 330 Charleston Harbor
AMZ 350 South Santee River to Edisto Beach out 20 n miles
AMZ 352 Edisto Beach to Savannah out 20 n miles
AMZ 354 Savannah to Altamaha Sound out 20 n miles
AMZ 374 Savannah to Altamaha Sound 20 to 60 n miles
AMZ 450 Altamaha Sound to Fernandina Beach out 20 n miles
AMZ 470 Altamaha Sound to Fernandina Beach 20 to 60 n miles

COASTAL MARINE ZONE WARNING AREAS

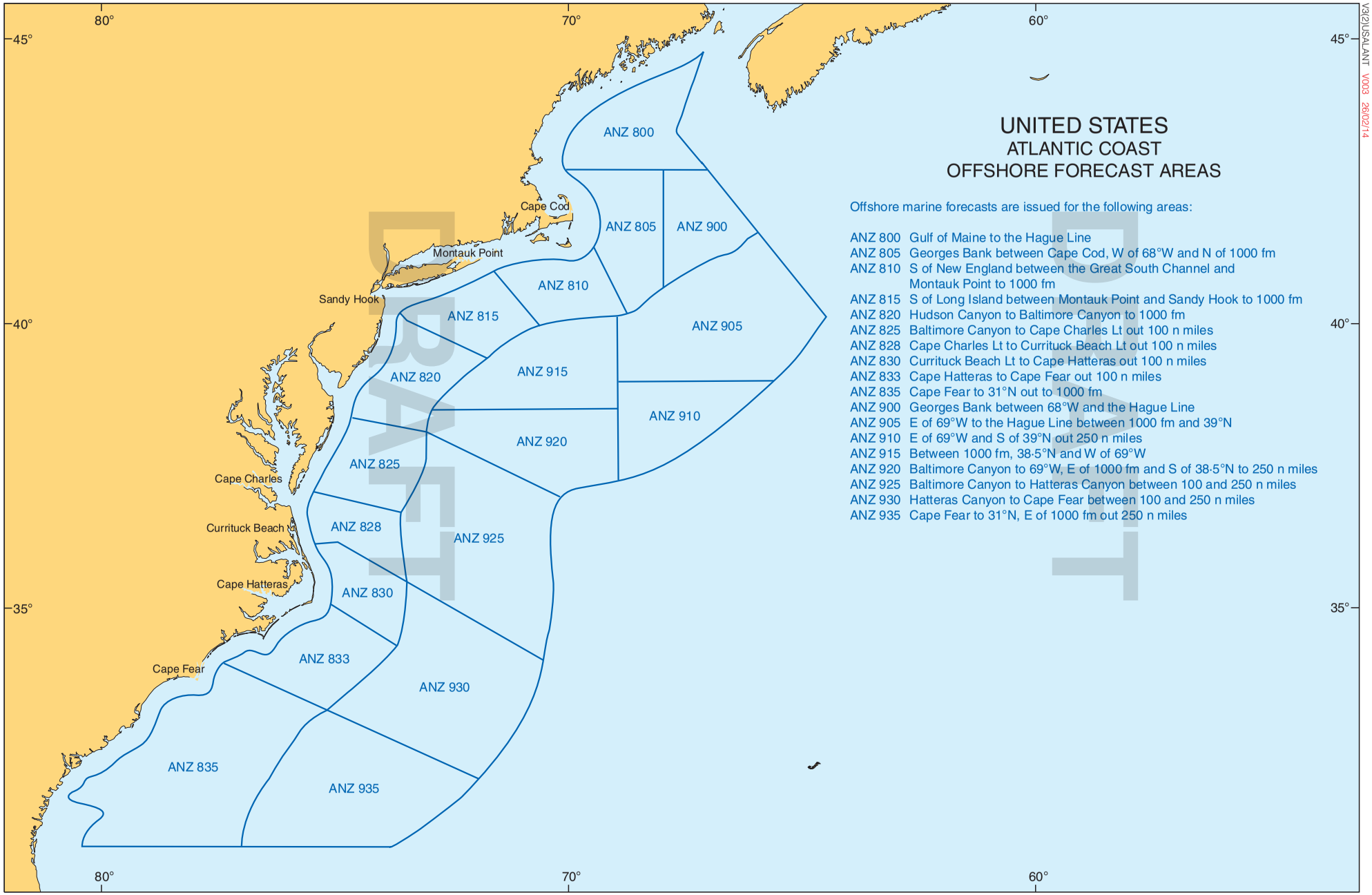
These areas are part of the Offshore Forecast Areas but will issue warnings for short duration convective events

AMZ 170 Currituck Beach Light to Surf City from 20 to 40 n miles
AMZ 270 Surf City to South Santee River from 20 to 40 n miles
AMZ 370 South Santee River to Savannah from 20 to 40 n miles

WAVE FORECASTS APPEARING IN COASTAL MARINE FORECASTS

Wave height forecasts are for average wave conditions to be encountered in open coastal waters except if otherwise indicated. Values are for waves produced by wind and do not take into account areas of normally higher or steeper waves found near bars, shoals or restricted entrances into sounds or inlets. Occasionally waves can combine and peak out at twice the forecast value. Where possible, swell waves will be separately described.

V3(2)NOAA2 V008 08/07/14


80°
70°
60°
45°
40°
35°
ANZ 800
ANZ 805
ANZ 900
ANZ 810
ANZ 815
ANZ 905
ANZ 820
ANZ 915
ANZ 910
ANZ 920
ANZ 825
ANZ 828
ANZ 925
ANZ 830
ANZ 833
ANZ 930
ANZ 835
ANZ 935
Cape Cod
Montauk Point
Sandy Hook
Cape Charles
Currituck Beach
Cape Hatteras
Cape Fear
UNITED STATES
ATLANTIC COAST
OFFSHORE FORECAST AREAS
Offshore marine forecasts are issued for the following areas:
ANZ 800 Gulf of Maine to the Hague Line
ANZ 805 Georges Bank between Cape Cod, W of 68°W and N of 1000 fm
ANZ 810 S of New England between the Great South Channel and Montauk Point to 1000 fm
ANZ 815 S of Long Island between Montauk Point and Sandy Hook to 1000 fm
ANZ 820 Hudson Canyon to Baltimore Canyon to 1000 fm
ANZ 825 Baltimore Canyon to Cape Charles Lt out 100 n miles
ANZ 828 Cape Charles Lt to Currituck Beach Lt out 100 n miles
ANZ 830 Currituck Beach Lt to Cape Hatteras out 100 n miles
ANZ 833 Cape Hatteras to Cape Fear out 100 n miles
ANZ 835 Cape Fear to 31°N out to 1000 fm
ANZ 900 Georges Bank between 68°W and the Hague Line
ANZ 905 E of 69°W to the Hague Line between 1000 fm and 39°N
ANZ 910 E of 69°W and S of 39°N out 250 n miles
ANZ 915 Between 1000 fm, 38·5°N and W of 69°W
ANZ 920 Baltimore Canyon to 69°W, E of 1000 fm and S of 38·5°N to 250 n miles
ANZ 925 Baltimore Canyon to Hatteras Canyon between 100 and 250 n miles
ANZ 930 Hatteras Canyon to Cape Fear between 100 and 250 n miles
ANZ 935 Cape Fear to 31°N, E of 1000 fm out 250 n miles
V3(2)USALANT V003 26/02/14

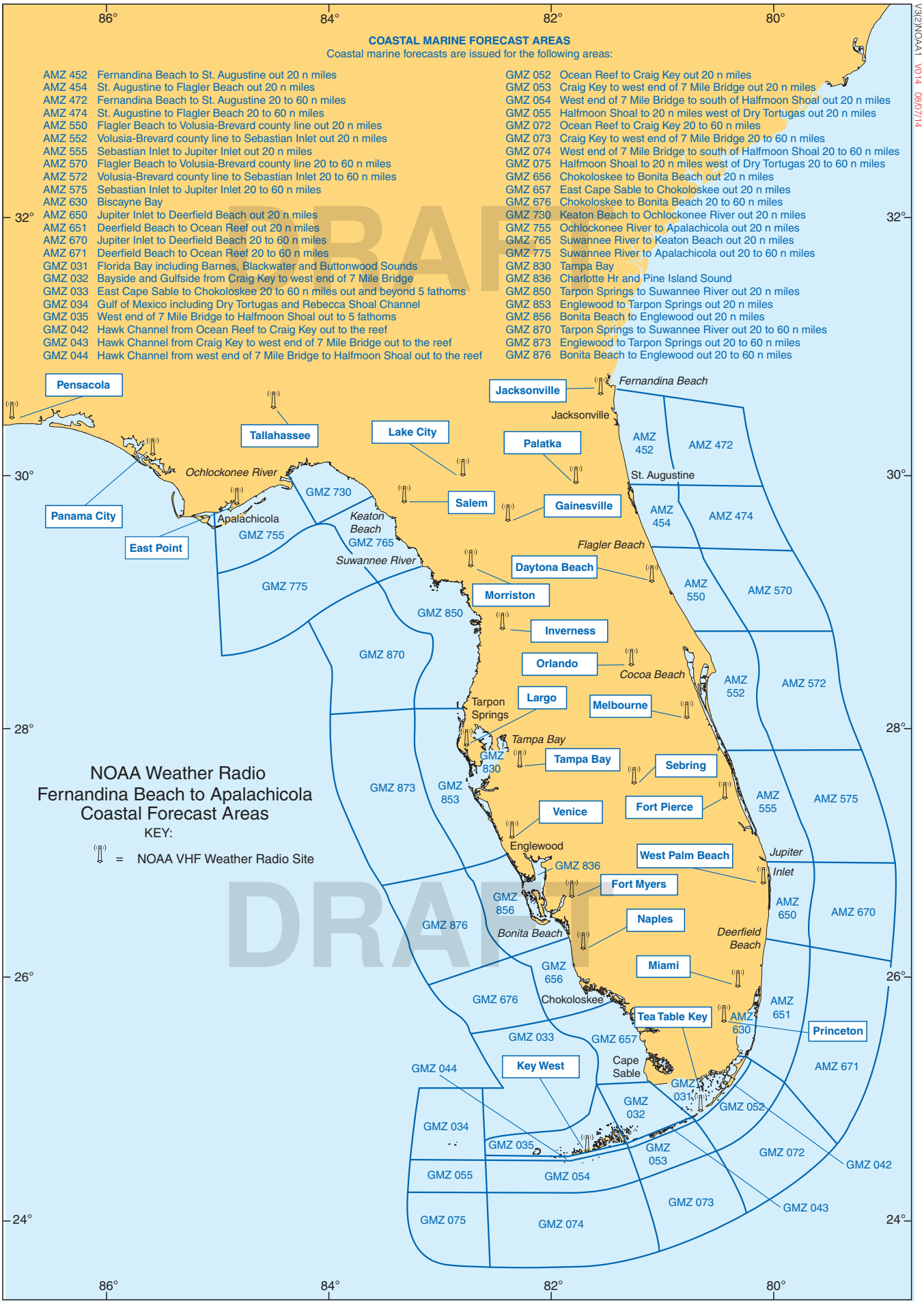
UNITED STATES (Atlantic Coast)

BOSTON SECTOR (US COAST GUARD)				
Control Centre: 42°22′·11N 71°03′·14W				
	Ch 22A	VHF	Boston Sector (VHF aerial)	42°22′·11N 71°03′·14W
Diagrams pages 239 and 244				
Weather Bulletins				
1035 2235	Local weather and offshore forecasts.			
Navigational Warnings				
On receipt then at 1035 2235	Storm and local Navigational Warnings.			

CHARLESTON SECTOR (US COAST GUARD)				
Control Centre: 32°46′·42N 79°56′·64W				
	Ch 22A	VHF		32°46′·42N 79°56′·64W
Diagrams pages 243, 244, 246 and 251				
Weather Bulletins				
1200 2200	Local weather and offshore forecasts.			
Navigational Warnings				
On receipt 1200 2200	Storm and local Navigational Warnings.			

CHESAPEAKE RCF (US Coast Guard) (NMN)				
Control Centre: 36°43′·72N 76°00′·60W				
A	4426 *(Ch 424)*	RT (HF)		
B	6501 *(Ch 601)*			
C	8764 *(Ch 816)*			
D	13089 *(Ch 1205)*			
E	17314 *(Ch 1625)*			
Diagrams pages 244, 251, 265 and 266				
Weather Bulletins				
A: 0330 0930 **B, C:** 0330 0930 1530 2130 **D:** 1530 2130	Offshore forecasts, hurricane information.			
A: 0515 **B:** 0515 1115 2315 **C:** 0515 1115 1715 2315 **D:** 1115 1715 2315 **E:** 1715	High seas forecast, hurricane information.			
NOTE(S): Broadcasts are remotely controlled from COMMCOM.				

DELAWARE BAY SECTOR (US COAST GUARD)				
Control Centre: 39°56′·01N 75°08′·52W				
	Ch 22A	VHF	Delaware Bay	38°56′·68N 74°53′·03W
Diagrams pages 241 and 242				
Weather Bulletins				
0035[1] 1103[2] 1235[1] 2303[2]	Local weather and offshore forecasts.			
Navigational Warnings				
On receipt[3] 0035[1] 1103[2] 1235[1] 2303[2]	Storm and local Navigational Warnings.			
[1] Rivers [2] Coastal [3] Coastal and Rivers				


COASTAL MARINE FORECAST AREAS
Coastal marine forecasts are issued for the following areas:
AMZ 452 Fernandina Beach to St. Augustine out 20 n miles
AMZ 454 St. Augustine to Flagler Beach out 20 n miles
AMZ 472 Fernandina Beach to St. Augustine 20 to 60 n miles
AMZ 474 St. Augustine to Flagler Beach 20 to 60 n miles
AMZ 550 Flagler Beach to Volusia-Brevard county line out 20 n miles
AMZ 552 Volusia-Brevard county line to Sebastian Inlet out 20 n miles
AMZ 555 Sebastian Inlet to Jupiter Inlet out 20 n miles
AMZ 570 Flagler Beach to Volusia-Brevard county line 20 to 60 n miles
AMZ 572 Volusia-Brevard county line to Sebastian Inlet 20 to 60 n miles
AMZ 575 Sebastian Inlet to Jupiter Inlet 20 to 60 n miles
AMZ 630 Biscayne Bay
AMZ 650 Jupiter Inlet to Deerfield Beach out 20 n miles
AMZ 651 Deerfield Beach to Ocean Reef out 20 n miles
AMZ 670 Jupiter Inlet to Deerfield Beach 20 to 60 n miles
AMZ 671 Deerfield Beach to Ocean Reef 20 to 60 n miles
GMZ 031 Florida Bay including Barnes, Blackwater and Buttonwood Sounds
GMZ 032 Bayside and Gulfside from Craig Key to west end of 7 Mile Bridge
GMZ 033 East Cape Sable to Chokoloskee 20 to 60 n miles out and beyond 5 fathoms
GMZ 034 Gulf of Mexico including Dry Tortugas and Rebecca Shoal Channel
GMZ 035 West end of 7 Mile Bridge to Halfmoon Shoal out to 5 fathoms
GMZ 042 Hawk Channel from Ocean Reef to Craig Key out to the reef
GMZ 043 Hawk Channel from Craig Key to west end of 7 Mile Bridge out to the reef
GMZ 044 Hawk Channel from west end of 7 Mile Bridge to Halfmoon Shoal out to the reef
GMZ 052 Ocean Reef to Craig Key out 20 n miles
GMZ 053 Craig Key to west end of 7 Mile Bridge out 20 n miles
GMZ 054 West end of 7 Mile Bridge to south of Halfmoon Shoal out 20 n miles
GMZ 055 Halfmoon Shoal to 20 n miles west of Dry Tortugas out 20 n miles
GMZ 072 Ocean Reef to Craig Key 20 to 60 n miles
GMZ 073 Craig Key to west end of 7 Mile Bridge 20 to 60 n miles
GMZ 074 West end of 7 Mile Bridge to south of Halfmoon Shoal 20 to 60 n miles
GMZ 075 Halfmoon Shoal to 20 n miles west of Dry Tortugas 20 to 60 n miles
GMZ 656 Chokoloskee to Bonita Beach out 20 n miles
GMZ 657 East Cape Sable to Chokoloskee out 20 n miles
GMZ 676 Chokoloskee to Bonita Beach 20 to 60 n miles
GMZ 730 Keaton Beach to Ochlockonee River out 20 n miles
GMZ 755 Ochlockonee River to Apalachicola out 20 n miles
GMZ 765 Suwannee River to Keaton Beach out 20 n miles
GMZ 775 Suwannee River to Apalachicola out 20 to 60 n miles
GMZ 830 Tampa Bay
GMZ 836 Charlotte Hr and Pine Island Sound
GMZ 850 Tarpon Springs to Suwannee River out 20 n miles
GMZ 853 Englewood to Tarpon Springs out 20 n miles
GMZ 856 Bonita Beach to Englewood out 20 n miles
GMZ 870 Tarpon Springs to Suwannee River out 20 to 60 n miles
GMZ 873 Englewood to Tarpon Springs out 20 to 60 n miles
GMZ 876 Bonita Beach to Englewood out 20 to 60 n miles
DRAFT
V3(2)NOAA1 V014 08/07/14
86°
84°
82°
80°
32°
30°
28°
26°
24°
Pensacola
Tallahassee
Lake City
Jacksonville
Fernandina Beach
Jacksonville
Palatka
Panama City
East Point
Ochlockonee River
Apalachicola
Keaton Beach
Suwannee River
Salem
Gainesville
St. Augustine
Flagler Beach
Daytona Beach
Morriston
Inverness
Orlando
Cocoa Beach
Largo
Tarpon Springs
Melbourne
Tampa Bay
Tampa Bay
Sebring
Venice
Fort Pierce
Englewood
West Palm Beach
Jupiter Inlet
Fort Myers
Naples
Bonita Beach
Deerfield Beach
Miami
Chokoloskee
Tea Table Key
Princeton
Key West
Cape Sable
AMZ 452
AMZ 472
AMZ 454
AMZ 474
AMZ 550
AMZ 570
AMZ 552
AMZ 572
AMZ 555
AMZ 575
AMZ 650
AMZ 670
AMZ 651
AMZ 630
AMZ 671
GMZ 730
GMZ 755
GMZ 765
GMZ 775
GMZ 850
GMZ 870
GMZ 830
GMZ 853
GMZ 873
GMZ 836
GMZ 856
GMZ 876
GMZ 656
GMZ 676
GMZ 033
GMZ 657
GMZ 044
GMZ 031
GMZ 032
GMZ 052
GMZ 034
GMZ 035
GMZ 053
GMZ 072
GMZ 042
GMZ 055
GMZ 054
GMZ 073
GMZ 043
GMZ 075
GMZ 074
NOAA Weather Radio
Fernandina Beach to Apalachicola
Coastal Forecast Areas
KEY:
= NOAA VHF Weather Radio Site
DRAFT

UNITED STATES (Atlantic Coast)

HAMPTON ROADS SECTOR (US COAST GUARD)				
Control Centre: 36°53′·02N 76°21′·15W				
	Ch 22A	VHF		36°53′·02N 76°21′·15W
Diagrams pages 241 and 242				
Weather Bulletins				
0230 1120	Local weather and offshore forecasts.			
Navigational Warnings				
On receipt 0230 1120	Storm and local Navigational Warnings.			

JACKSONVILLE SECTOR (US COAST GUARD)				
Control Centre: 30°23′·27N 81°26′·06W				
	Ch 22A	VHF		30°23′·27N 81°26′·06W
Diagrams pages 243, 246 and 251				
Navigational Warnings				
On receipt	Storm and local Navigational Warnings.			

LONG ISLAND SOUND SECTOR (US COAST GUARD) (NEW HAVEN)				
Control Centre: 41°16′·33N 72°54′·26W				
	Ch 22A	VHF		41°16′·33N 72°54′·26W
Diagram page 240				
Weather Bulletins				
1120 2320	Local weather.			
Navigational Warnings				
On receipt 1120 2320	Storm and local Navigational Warnings.			

MARYLAND NATIONAL CAPITAL REGION SECTOR (US COAST GUARD)				
Control Centre: 39°12′·26N 76°34′·09W				
	Ch 22A	VHF		39°12′·26N 76°34′·09W
Diagram page 241				
Weather Bulletins				
0130 1205	Local weather.			
Navigational Warnings				
On receipt 0130 1205	Storm and local Navigational Warnings.			

MIAMI SECTOR (US COAST GUARD)				
Control Centre: 25°46′·25N 80°08′·69W				
	Ch 22A	VHF		25°46′·25N 80°08′·69W
Diagrams pages 246 and 251				
Navigational Warnings				
On receipt	Storm and local Navigational Warnings.			

NORTH CAROLINA SECTOR (FORT MACON) (US COAST GUARD)				
Control Centre: 34°11′·78N 77°56′·04W				
	Ch 22A	VHF		
Diagrams pages 243 and 244				
Navigational Warnings				
On receipt	Storm and local Navigational Warnings.			

UNITED STATES (Atlantic Coast)

NORTHERN NEW ENGLAND SECTOR (US COAST GUARD) (SOUTH PORTLAND)				
Control Centre: 43°38′·68N 70°14′·77W				
	Ch 22A	VHF		43°38′·68N 70°14′·77W
Diagrams pages 239 and 244				
Weather Bulletins				
1105 2305	Local weather and offshore forecasts.			
Navigational Warnings				
On receipt 1105 2305	Storm and local Navigational Warnings.			

SOUTHEASTERN NEW ENGLAND (US COAST GUARD) (WOODS HOLE)				
Control Centre: 41°31′·24N 70°40′·03W				
	Ch 22A	VHF		41°31′·24N 70°40′·03W
Diagrams pages 239 and 240				
Weather Bulletins				
1005 2205	Local weather and offshore forecasts.			
Navigational Warnings				
On receipt 1005 2205	Storm and local Navigational Warnings.			

UNITED STATES (Great Lakes)

BUFFALO SECTOR (US COAST GUARD)				
Control Centre: 42°52′·60N 78°53′·21W				
	Ch 22A	VHF		
Weather Bulletins				
0255 1455	Local weather.			
Navigational Warnings				
On receipt 0255 1455	Storm and local Navigational Warnings.			

DETROIT SECTOR (US COAST GUARD)				
Control Centre: 42°20′·44N 83°00′·45W				
	Ch 22A	VHF		
Weather Bulletins				
0135 1335	Local weather.			
Navigational Warnings				
On receipt 0135 1335	Storm and local Navigational Warnings.			

LAKE MICHIGAN SECTOR (US COAST GUARD)				
Control Centre: 43°00′·15N 87°53′·40W				
	Ch 22A	VHF		
Weather Bulletins				
0255 1455	Local weather.			
Navigational Warnings				
On receipt 0255 1455	Storm and local Navigational Warnings.			

SAULT SAINTE MARIE SECTOR (US COAST GUARD)				
Control Centre: 46°29′·95N 84°20′·30W				
	Ch 22A	VHF		
Weather Bulletins				
0005 1205	Local weather.			
Navigational Warnings				
On receipt 0005 1205	Storm and local Navigational Warnings.			

UNITED STATES (Gulf Coast)

NAVTEX

G	New Orleans	518 kHz	29°53′·08N 89°56′·74W
Diagrams pages 39, 246, 250 and 251			
Weather Bulletins			
G: 0100 0500 1300 1700	Weather forecast.		
Navigational Warnings			
G: 0100 0500 0900 1300 1700 2100	Weather and Navigational Warnings.		

CORPUS CHRISTI SECTOR (US COAST GUARD)

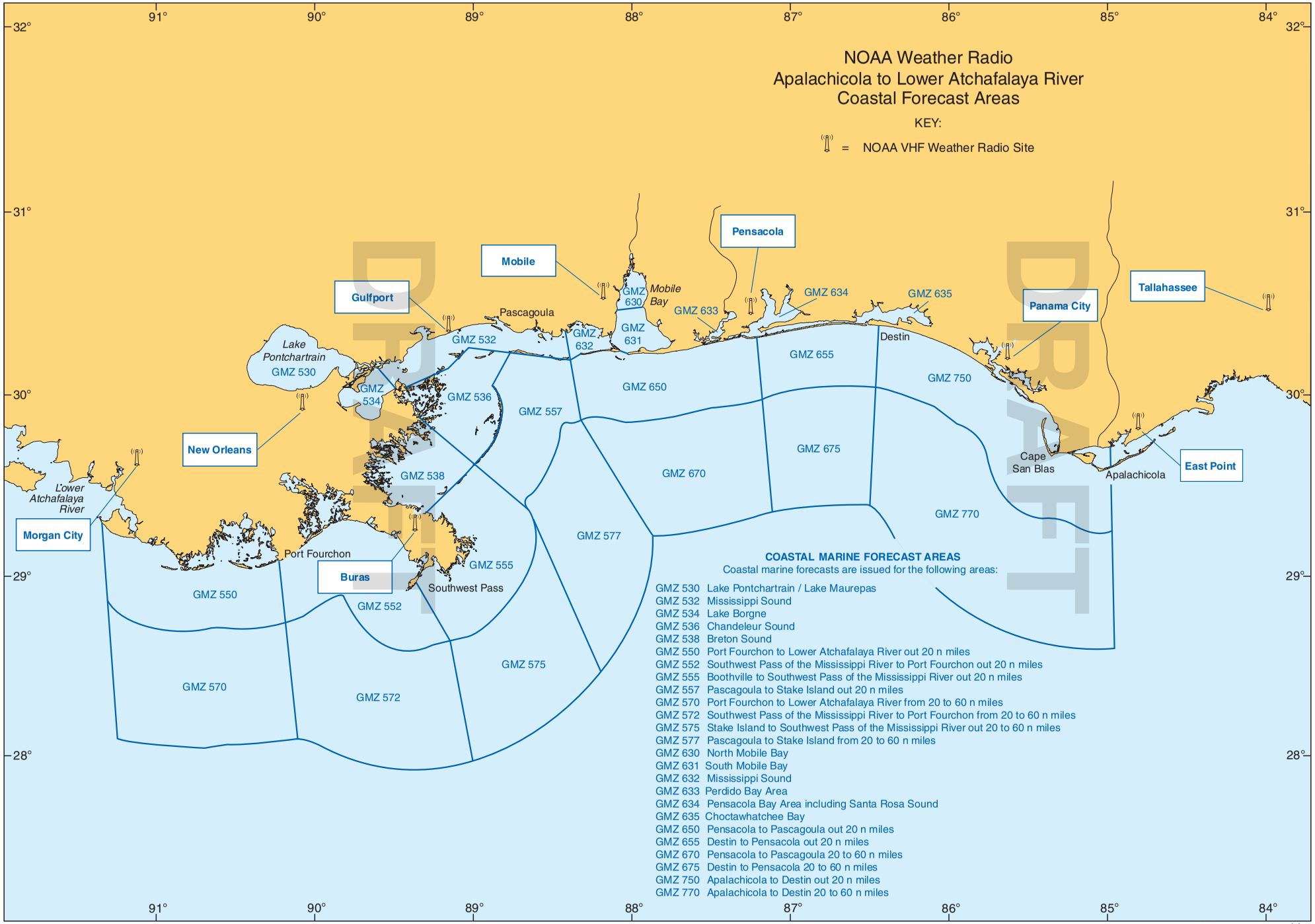
Control Centre: 27°42′·08N 97°16′·73W				
	Ch 22A	VHF		27°42′·08N 97°16′·73W
Diagrams pages 251 and 252				
Weather Bulletins				
1040 1240 1640 2240	Local weather and offshore forecasts.			
Navigational Warnings				
On receipt 1040 1240 1640 2240	Storm and local Navigational Warnings.			

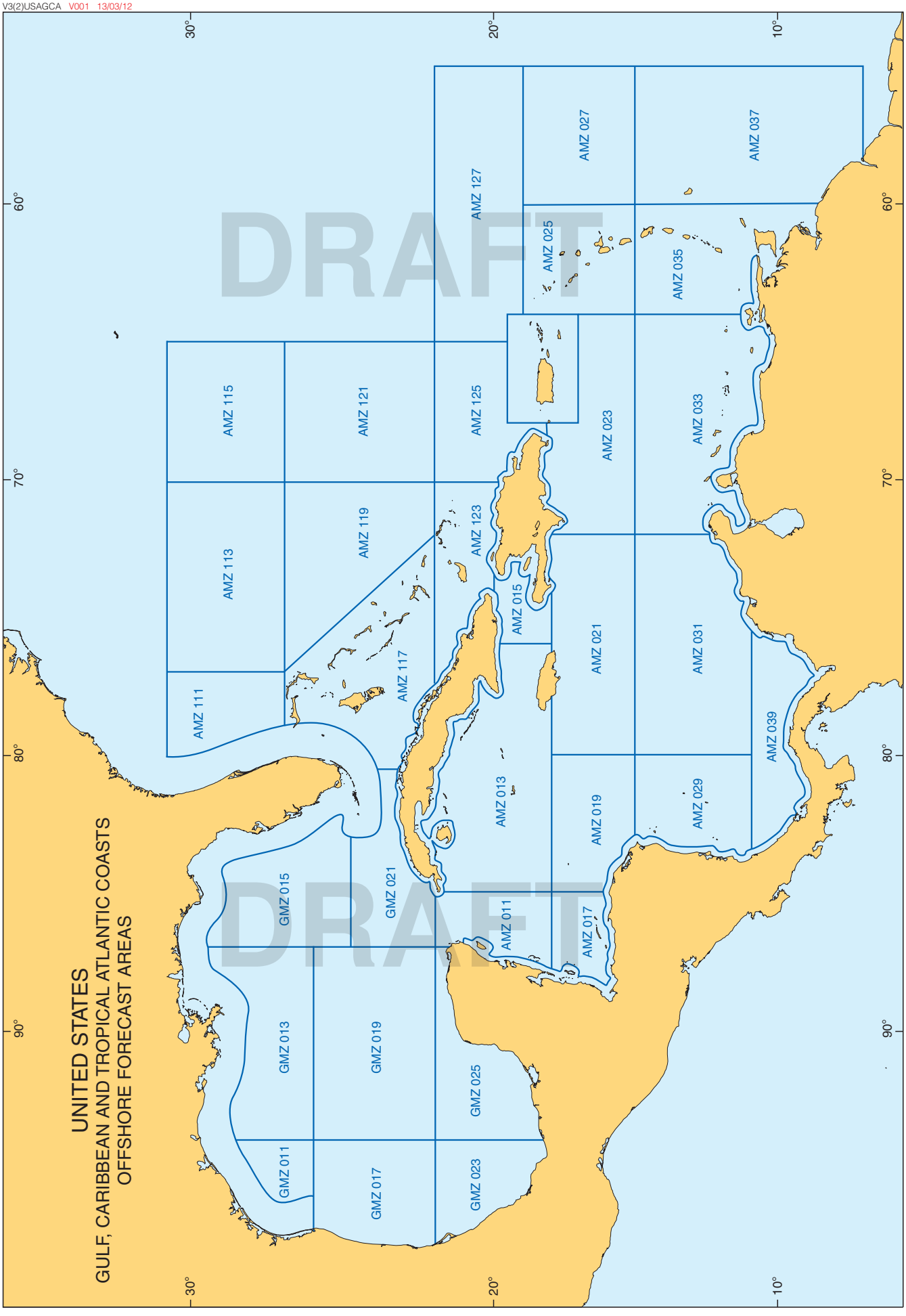
HOUSTON-GALVESTON SECTOR (US COAST GUARD)

Control Centre: 29°43′·78N 95°15′·44W				
	Ch 22A	VHF		29°43′·78N 95°15′·44W
Diagrams pages 251 and 252				
Weather Bulletins				
1050 1250 1650 2250	Local weather and offshore forecasts.			
Navigational Warnings				
On receipt 1050 1250 1650 2250	Storm and local Navigational Warnings.			

KEY WEST SECTOR (US COAST GUARD)

Control Centre: 24°33′·88N 81°47′·86W				
	Ch 22A	VHF	Key West	24°32′·90N 81°47′·19W
Diagrams pages 246 and 251				
Weather Bulletins				
1200 2200	Local weather.			
Navigational Warnings				
On receipt 1200 2200	Storm and local Navigational Warnings.			


NOAA Weather Radio
Apalachicola to Lower Atchafalaya River
Coastal Forecast Areas
KEY:
= NOAA VHF Weather Radio Site
32°
31°
30°
29°
28°
91°
90°
89°
88°
87°
86°
85°
84°
Mobile
Pensacola
Gulfport
Panama City
Tallahassee
New Orleans
Morgan City
Buras
East Point
Apalachicola
Destin
Pascagoula
Mobile Bay
Lake Pontchartrain
GMZ 530
L'ower Atchafalaya River
Port Fourchon
Southwest Pass
Cape San Blas
GMZ 530
GMZ 532
GMZ 534
GMZ 536
GMZ 538
GMZ 550
GMZ 552
GMZ 555
GMZ 557
GMZ 570
GMZ 572
GMZ 575
GMZ 577
GMZ 630
GMZ 631
GMZ 632
GMZ 633
GMZ 634
GMZ 635
GMZ 650
GMZ 655
GMZ 670
GMZ 675
GMZ 750
GMZ 770
COASTAL MARINE FORECAST AREAS
Coastal marine forecasts are issued for the following areas:
GMZ 530 Lake Pontchartrain / Lake Maurepas
GMZ 532 Mississippi Sound
GMZ 534 Lake Borgne
GMZ 536 Chandeleur Sound
GMZ 538 Breton Sound
GMZ 550 Port Fourchon to Lower Atchafalaya River out 20 n miles
GMZ 552 Southwest Pass of the Mississippi River to Port Fourchon out 20 n miles
GMZ 555 Boothville to Southwest Pass of the Mississippi River out 20 n miles
GMZ 557 Pascagoula to Stake Island out 20 n miles
GMZ 570 Port Fourchon to Lower Atchafalaya River from 20 to 60 n miles
GMZ 572 Southwest Pass of the Mississippi River to Port Fourchon from 20 to 60 n miles
GMZ 575 Stake Island to Southwest Pass of the Mississippi River out 20 to 60 n miles
GMZ 577 Pascagoula to Stake Island from 20 to 60 n miles
GMZ 630 North Mobile Bay
GMZ 631 South Mobile Bay
GMZ 632 Mississippi Sound
GMZ 633 Perdido Bay Area
GMZ 634 Pensacola Bay Area including Santa Rosa Sound
GMZ 635 Choctawhatchee Bay
GMZ 650 Pensacola to Pascagoula out 20 n miles
GMZ 655 Destin to Pensacola out 20 n miles
GMZ 670 Pensacola to Pascagoula 20 to 60 n miles
GMZ 675 Destin to Pensacola 20 to 60 n miles
GMZ 750 Apalachicola to Destin out 20 n miles
GMZ 770 Apalachicola to Destin 20 to 60 n miles
DRAFT
V3(2)NOAA3 V008 30/08/12


UNITED STATES
GULF, CARIBBEAN AND TROPICAL ATLANTIC COASTS
OFFSHORE FORECAST AREAS
DRAFT
DRAFT
AMZ 111
AMZ 113
AMZ 115
AMZ 117
AMZ 119
AMZ 121
AMZ 123
AMZ 125
AMZ 127
AMZ 011
AMZ 013
AMZ 015
AMZ 017
AMZ 019
AMZ 021
AMZ 023
AMZ 025
AMZ 027
AMZ 029
AMZ 031
AMZ 033
AMZ 035
AMZ 037
AMZ 039
GMZ 011
GMZ 013
GMZ 015
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GMZ 021
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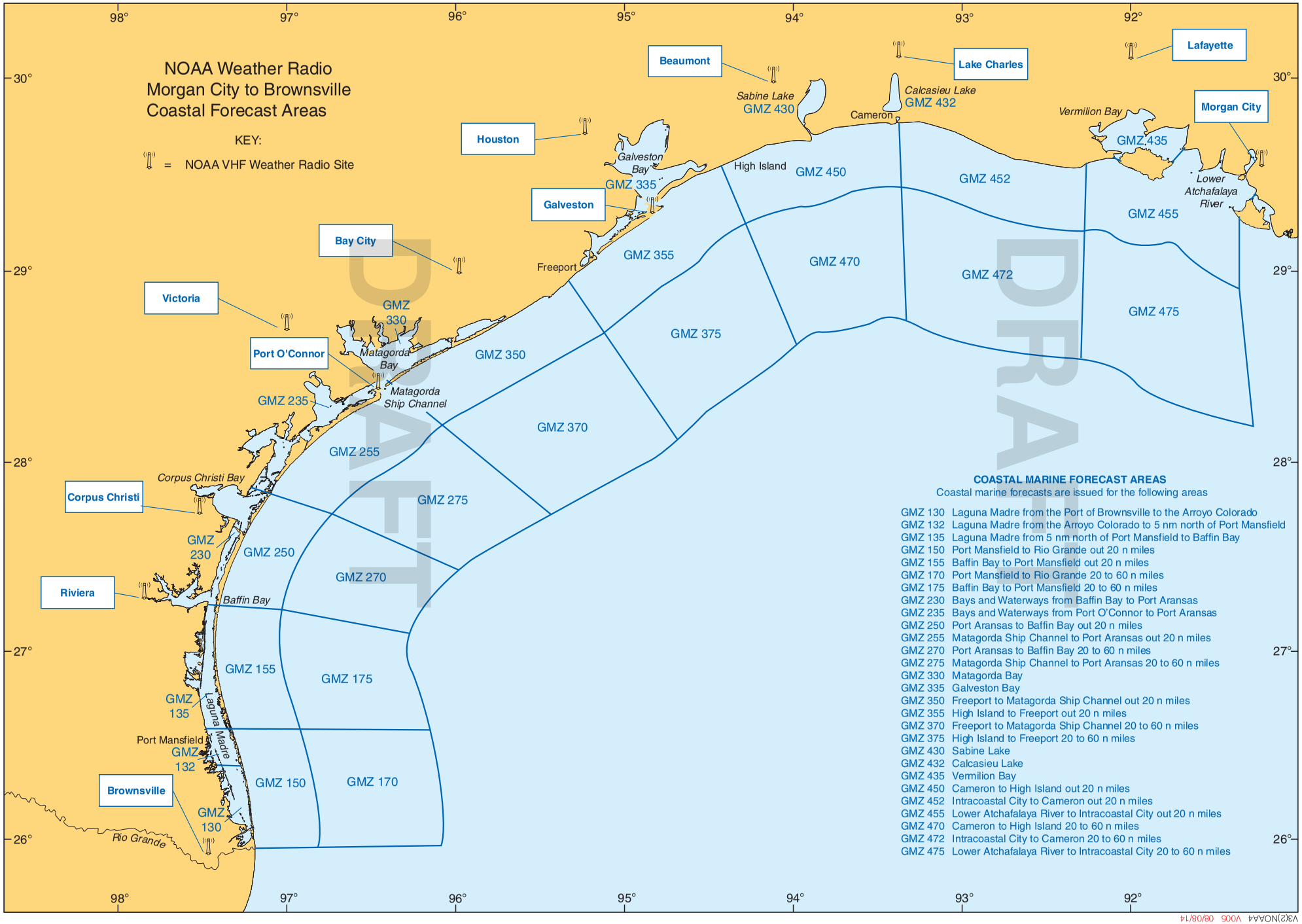
GMZ 025
30°
20°
10°
90°
80°
70°
60°



COASTAL MARINE FORECAST AREAS

Coastal marine forecasts are issued for the following areas

GMZ 130 Laguna Madre from the Port of Brownsville to the Arroyo Colorado
GMZ 132 Laguna Madre from the Arroyo Colorado to 5 nm north of Port Mansfield
GMZ 135 Laguna Madre from 5 nm north of Port Mansfield to Baffin Bay
GMZ 150 Port Mansfield to Rio Grande out 20 n miles
GMZ 155 Baffin Bay to Port Mansfield out 20 n miles
GMZ 170 Port Mansfield to Rio Grande 20 to 60 n miles
GMZ 175 Baffin Bay to Port Mansfield 20 to 60 n miles
GMZ 230 Bays and Waterways from Baffin Bay to Port Aransas
GMZ 235 Bays and Waterways from Port O'Connor to Port Aransas
GMZ 250 Port Aransas to Baffin Bay out 20 n miles
GMZ 255 Matagorda Ship Channel to Port Aransas out 20 n miles
GMZ 270 Port Aransas to Baffin Bay 20 to 60 n miles
GMZ 275 Matagorda Ship Channel to Port Aransas 20 to 60 n miles
GMZ 330 Matagorda Bay
GMZ 335 Galveston Bay
GMZ 350 Freeport to Matagorda Ship Channel out 20 n miles
GMZ 355 High Island to Freeport out 20 n miles
GMZ 370 Freeport to Matagorda Ship Channel 20 to 60 n miles
GMZ 375 High Island to Freeport 20 to 60 n miles
GMZ 430 Sabine Lake
GMZ 432 Calcasieu Lake
GMZ 435 Vermilion Bay
GMZ 450 Cameron to High Island out 20 n miles
GMZ 452 Intracoastal City to Cameron out 20 n miles
GMZ 455 Lower Atchafalaya River to Intracoastal City out 20 n miles
GMZ 470 Cameron to High Island 20 to 60 n miles
GMZ 472 Intracoastal City to Cameron 20 to 60 n miles
GMZ 475 Lower Atchafalaya River to Intracoastal City 20 to 60 n miles

V3(2)NOAA4 V005 08/08/14

UNITED STATES (Gulf Coast)

MOBILE (WLO) [1090]				
Control Centre: 30°35′·63N 88°13′·44W				
A	4369 *(Ch 405)* 4396 *(Ch 414)* 6519 *(Ch 607)* 8788 *(Ch 824)* 8806 *(Ch 830)* 13110 *(Ch 1212)* 13152 *(Ch 1226)* 17260 *(Ch 1607)* 17362 *(Ch 1641)* 22804 *(Ch 2237)*	RT (HF)		
B	4213 *(Ch 406)* 6317 *(Ch 606)* 8421 *(Ch 810)* 12581·5 *(Ch 1205)* 16809 *(Ch 1605)* 22383·5 *(Ch 2215)*	RADIO-TELEX		
Diagrams pages 244, 251, 265 and 266				
Weather Bulletins				
A: 0500 1100 1700 2300	Weather bulletins for Gulf of Mexico, Southwest North Atlantic and Caribbean.			
B: On request using command "WX+"	National Weather Service products. This service is chargeable.			
NOTE(S): All services operational H24				

MOBILE SECTOR (US COAST GUARD)				
Control Centre: 30°39′·11N 88°03′·49W				
	Ch 22A	VHF		30°39′·11N 88°03′·49W
Diagrams pages 250 and 251				
Weather Bulletins				
1020 1220 1620 2220	Local weather and offshore forecasts.			
Navigational Warnings				
On receipt 1020 1220 1620 2220	Storm and local Navigational Warnings.			

NEW ORLEANS RCF (US COAST GUARD EIGHTH DISTRICT) (NMG)				
Control Centre: 29°56′·98N 90°04′·59W				
	4316 8502 12788	RT (HF)	New Orleans RCF (HF aerial)	29°53′·00N 89°57′·00W
Diagrams pages 250, 251, 252 and 266				
Weather Bulletins				
0330 0930 1530 2130	Offshore forecasts.			
0515 1115 1715 2315	High seas forecast.			
Navigational Warnings				
0330 0515 0930 1115 1530 1715 2130 2315	Navigational Warnings and hurricane information.			
NOTE(S): HF broadcasts are remotely controlled from COMMCOM.				

NEW ORLEANS SECTOR (US COAST GUARD)				
Control Centre: 29°57′·15N 90°02′·24W				
	Ch 22A	VHF		
Diagrams pages 250, 251 and 252				
Weather Bulletins				
1035 1235 1635 2235	Local weather and offshore forecasts.			

Continued overleaf

UNITED STATES (Gulf Coast)

NEW ORLEANS SECTOR (US COAST GUARD) (Continued)

Navigational Warnings	
On receipt 1025 1235 1635 2235	Storm and local Navigational Warnings.

ST PETERSBURG SECTOR (US COAST GUARD)				
Control Centre: 27°45′·69N 82°37′·62W				
	Ch 22A	VHF		
Diagrams pages 246 and 251				
Weather Bulletins				
1300 2300	Local weather and offshore forecasts.			
Navigational Warnings				
On receipt 1300 2300	Storm and local Navigational Warnings.			

UNITED STATES (Hawaii)

INTERNET WEATHER SERVICES	
National Weather Service Forcast Office Honolulu www.prh.noaa.gov/pr/hnl	Marine weather forecasts in English.

NAVTEX			
O	Honolulu	518 kHz	21°25′·25N 158°09′·07W
Diagram page 39			
Weather Bulletins			
O: 0220 0620 1420 1820	Weather forecast.		
Navigational Warnings			
O: 0220 0620 1020 1420 1820 2220	Storm and Navigational Warnings.		
O: 0220 0620 1020 1420 1820 2220	Electronic Navigation Advisories.		

FIRING PRACTICE AREA - OAHU KANEOHE BAY

Approximate Position: 21°26′·75N 157°45′·00W

Amphibious military operations may be underway at any time, day or night, within Kaneohe Bay (approximately 0·5 n miles South of Mokapu Peninsula). Surface support craft, equipped with appropriate signals and markings, can be reached on VHF Ch 82. To avoid injury to divers that may be in the area, it is requested that all vessels using Sonar contact Water Front Operations on VHF Ch 82A or by telephone on +1 808 257 2941.

The Ulupau Crater Weapons Training Range Danger Zone encompasses a sector extending seaward for 3·8 n miles between radial lines bearing 1° and 129° true, from a point on Mokapu Peninsula at 21°27′·17N 157°43′·75W. Live firing is indicated during daylight hours by two large red triangular warning pennants flown on the shore at Ulupau Crater and at night by flashing red warning beacons. The area is accessible whenever firing is not scheduled, indicated by the absence of any warning devices displayed ashore. Additional information may be obtained by calling the MCBH Range Manager (AC/S G-3) at +1 808 257 8816/17.

FIRING PRACTICE AREA - OAHU SOUTH COAST – KAPU

Approximate Position: 20°25′·00N 158°16′·00W

Special Operating Areas Four (SOA-4), a permanent “HOT AREA” named KAPU, operates during the hours 0700–2300 LT Mon–Fri, weekends 0800–1600 LT or by request. Activities include intermittent naval gunnery exercises and airborne ordnance drops. KAPU is also designated as the emergency jettison area for aircraft with hung stores, etc. The area is bounded by the following coordinates: 20°46′N 158°16′W, 20°42′N 158°04′W, 20°13′N 158°36′W and 20°04′N 158°11′W. Contact FACSFAC Pearl Harbor, call sign HULA DANCER, on primary 266·4/127·0 MHz or secondary 336·8/132·4 MHz, or by telephone: +1 808 472 7333/7337. Transit through these areas may be authorized on a case by case basis.

FIRING PRACTICE AREA - PACIFIC MISSILE RANGE FACILITY, BARKING SANDS

Approximate Position: 22°02′·00N 159°47′·36W

Diagram page 255

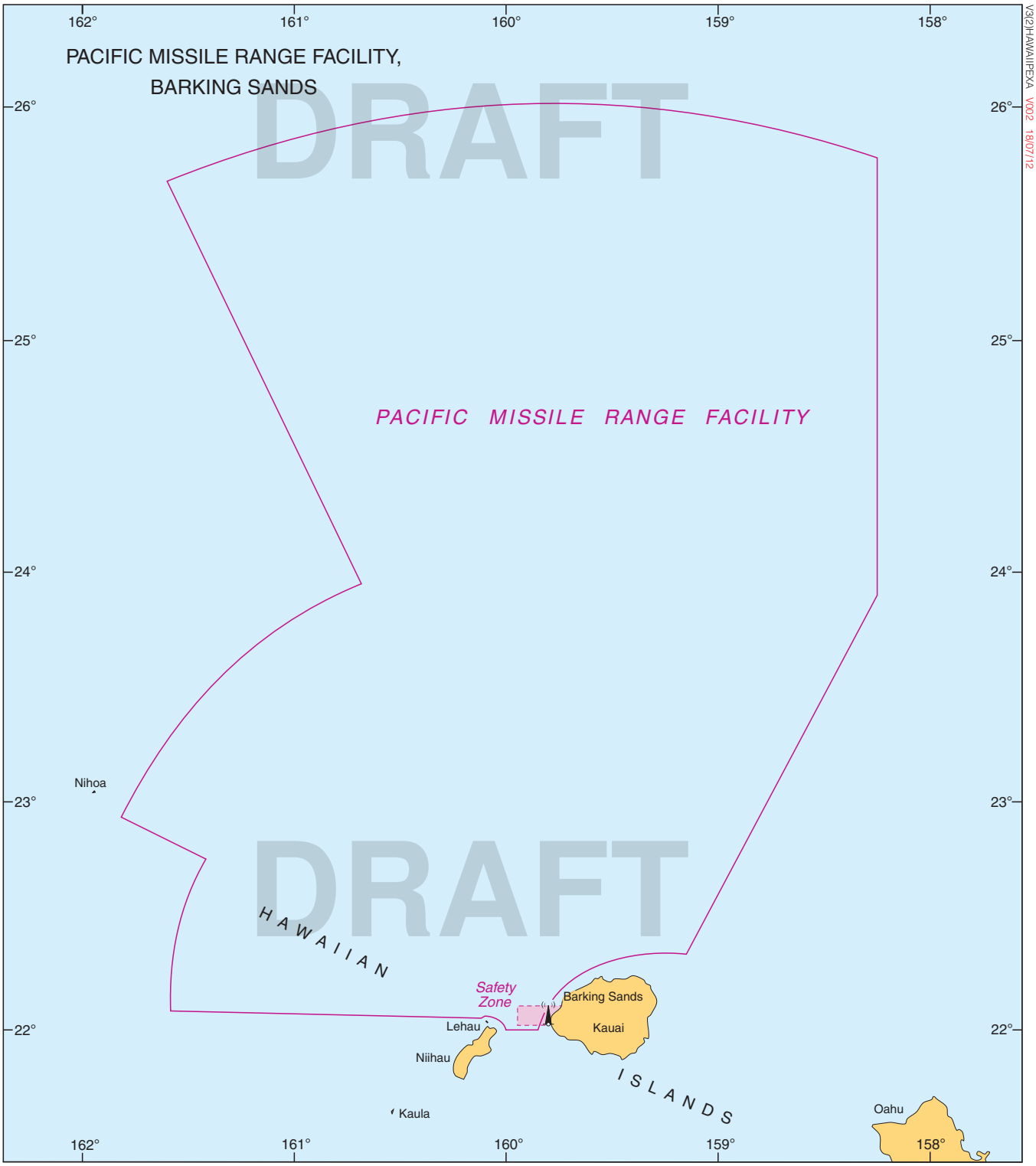
Vessels are requested to contact Missile Range Barking Sands on VHF Ch 16, (RT) MF 2182 kHz or (RT) HF 4491 kHz, before entering the area (see diagram for limits).

Vessels may be requested to alter course within the area due to intermittent missile firing operations.

Operations are conducted periodically throughout each week.

Mariners are advised to maintain a continuous listening watch whilst within range limits.

If unable to contact PMRF, messages should be relayed through US Coast Guard Honolulu (see ALRS Volume 1(2) (NP281(2)).


PACIFIC MISSILE RANGE FACILITY,
BARKING SANDS
DRAFT
DRAFT
PACIFIC MISSILE RANGE FACILITY
162°
161°
160°
159°
158°
26°
25°
24°
23°
22°
Nihoa
Safety Zone
Barking Sands
Kauai
Lehau
Niihau
Kaula
HAWAIIAN
ISLANDS
Oahu
V3(2)HAWAIIPEXA V002 18/07/12

UNITED STATES (Hawaii)

HONOLULU RCF (US COAST GUARD FOURTEENTH DISTRICT) (NMO)

Control Centre: 21°18′·39N 157°52′·41W

A	8416·5	RADIO-TELEX		
B	12579			
C	22376			
D	6501 *(Ch 601)*	RT (HF)		
E	8764 *(Ch 816)*			
F	13089 *(Ch 1205)*			

Diagrams pages 257, 265 and 266

Weather Bulletins

A, B: 0130 0730 1330 2030 **C:** 0130 2030 **D:** 0600 1200 **E:** 0005 0600 1200 1800 **F:** 0005 1800	Weather synopsis and forecast for Pacific High Seas.
A, B: 0130 0730 1330 2030 **C:** 0130 2030 **D:** 0600 1200 **E:** 0005 0600 1200 1800 **F:** 0005 1800	Offshore forecasts beyond 40 n miles out to 240 n miles.

Navigational Warnings

A, B: 0130 0730 1330 2030 **C:** 0130 2030 **D:** 0600 1200 **E:** 0005 0600 1200 1800 **F:** 0005 1800	Storm warnings for Pacific High Seas Forecast Areas.
A, B: 0130 0730 1330 2030 **C:** 0130 2030	NAVAREA XII warnings and Electronic Navigation Advisories.

NOTE(S): 1. The carrier frequency for Radio-Telex transmissions are 1·7 kHz below the assigned frequency shown.
2. Radio-Telex and RT (HF) broadcasts are remotely controlled from COMMCOM.

HONOLULU SECTOR (US COAST GUARD)

Control Centre: 21°18′·35N 157°52′·35W

	Ch 22A	VHF		

Diagram page 257

Weather Bulletins

0500 1700	Coastal waters forecast within 40 n miles.

Navigational Warnings

On receipt	Storm and Navigational Warnings.
0500 1700	Tsunami Watch/Warnings for Central Pacific, whilst in force.

KEKAHA (KAUAI) (WWVH)

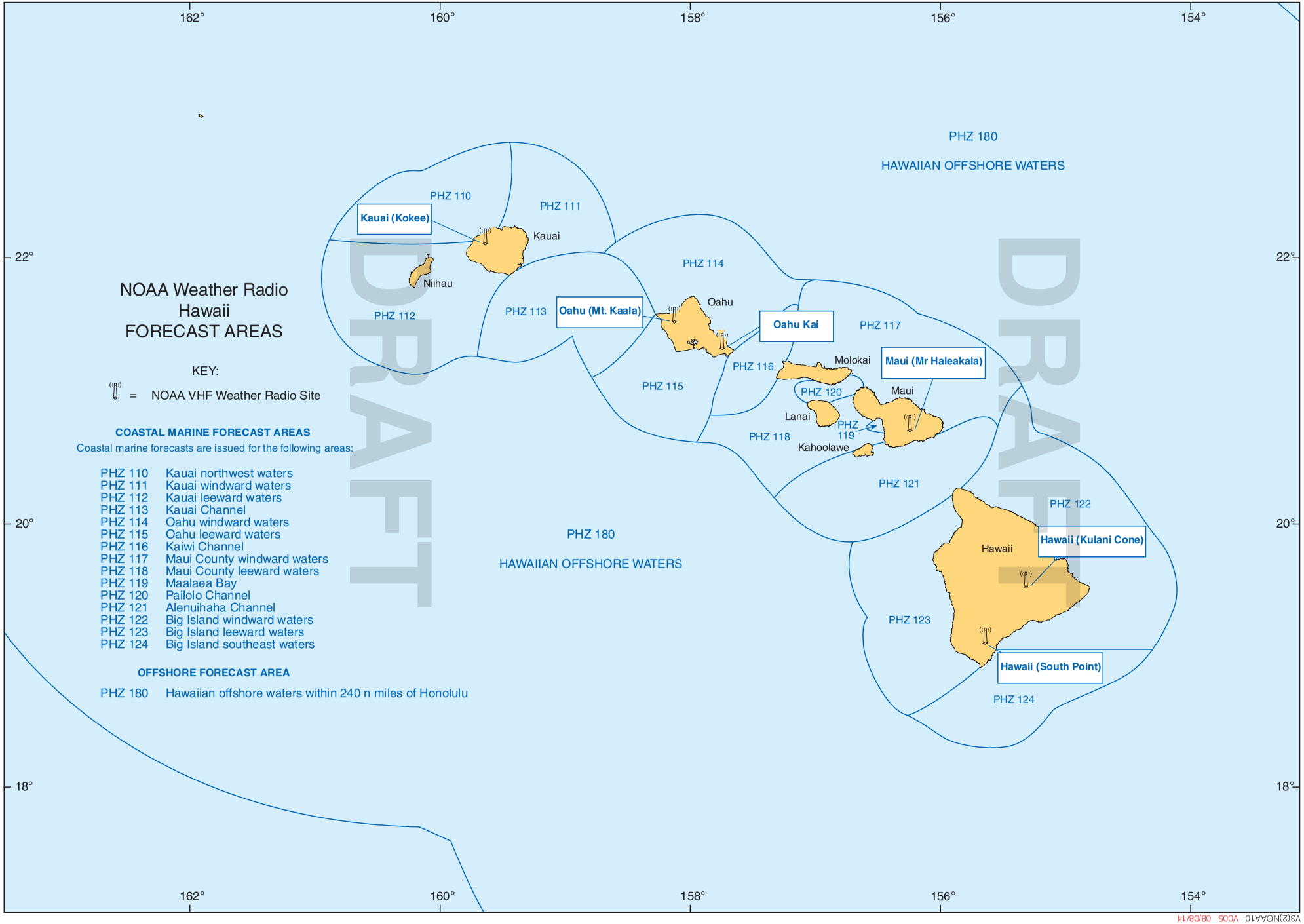
Control Centre: 21°59′·33N 159°45′·89W

	2500 kHz	AM	Kokole Point site 1	21°59′·35N 159°45′·87W
	5000 kHz		Kokole Point site 2	21°59′·18N 159°45′·75W
	10000 kHz		Kokole Point site 3	21°59′·30N 159°45′·86W
	15000 kHz		Kokole Point site 4	21°59′·26N 159°45′·83W

Diagrams pages 265 and 266

Navigational Warnings

H+48 through to H+51	Pacific high seas storm warnings.


NOAA Weather Radio
Hawaii
FORECAST AREAS
KEY:
= NOAA VHF Weather Radio Site
COASTAL MARINE FORECAST AREAS
Coastal marine forecasts are issued for the following areas:
PHZ 110 Kauai northwest waters
PHZ 111 Kauai windward waters
PHZ 112 Kauai leeward waters
PHZ 113 Kauai Channel
PHZ 114 Oahu windward waters
PHZ 115 Oahu leeward waters
PHZ 116 Kaiwi Channel
PHZ 117 Maui County windward waters
PHZ 118 Maui County leeward waters
PHZ 119 Maalaea Bay
PHZ 120 Pailolo Channel
PHZ 121 Alenuihaha Channel
PHZ 122 Big Island windward waters
PHZ 123 Big Island leeward waters
PHZ 124 Big Island southeast waters
OFFSHORE FORECAST AREA
PHZ 180 Hawaiian offshore waters within 240 n miles of Honolulu
PHZ 180
HAWAIIAN OFFSHORE WATERS
PHZ 180
HAWAIIAN OFFSHORE WATERS
PHZ 110
PHZ 111
PHZ 112
PHZ 113
PHZ 114
PHZ 115
PHZ 116
PHZ 117
PHZ 118
PHZ 119
PHZ 120
PHZ 121
PHZ 122
PHZ 123
PHZ 124
Kauai (Kokee)
Kauai
Niihau
Oahu (Mt. Kaala)
Oahu
Oahu Kai
Molokai
Maui (Mr Haleakala)
Maui
Lanai
Kahoolawe
Hawaii (Kulani Cone)
Hawaii
Hawaii (South Point)
162°
160°
158°
156°
154°
22°
20°
18°
DRAFT

UNITED STATES (Pacific Coast)

NAVTEX

W	Astoria	518 kHz	46°12′·00N 123°56′·79W
Q	Long Beach (Cambria)		35°31′·12N 121°03′·60W
C	POINT REYES RCF (San Francisco)		37°55′·53N 122°43′·87W

Diagrams pages 39, 259, 260, 261 and 262

Weather Bulletins

W: 0740 1140 1940 2340	Weather forecast
Q: 0640 1040 1840 2240	
C: 0020 0820 1220 2020	

Navigational Warnings

W: 0340 0740 1140 1540 1940 2340	Navigational and weather warnings.
Q: 0240 0640 1040 1440 1840 2240	
C: 0020 0420 0820 1220 1620 2020	
W: 0340 0740 1140 1540 1940 2340	Electronic Navigation Advisories.
C: 0020 0420 0820 1220 1620 2020	

FIRING PRACTICE AREA - PACIFIC MISSILE TEST RANGE, POINT MUGU

Approximate Position: 34°05′·50N 119°03′·00W

Diagram page 263

Departing the IMO approved TSS and transiting south of the Channel Islands may result in delays and diversions as this transit will take vessels through the Pacific Missile Test Range, Point Mugu, California (approximate position 34°05′·50N 119°03′·00W). The US Navy advises that hazardous operations may take place within the test range. The test range extends for 180 n miles in a South West direction from Point Mugu and is up to 210 n miles wide, see diagram for limits. The specific hazardous areas within the range are broadcast by the Navy daily Monday – Friday at 0900 and 1200 LT on 2638 and 2738 kHz. When notified by the Navy, the Coast Guard also broadcasts this information on VHF Ch 16.

When transiting south of the Channel Islands (inward-bound or outward-bound to the Ports of Los Angeles and Long Beach) all mariners should communicate with Navy PLEAD CONTROL in a timely manner so that early decisions can be made regarding safe routeing. Every effort should be made to comply fully with any instructions received from the Navy. For information regarding the status of current hazardous operations contact PLEAD CONTROL on VHF Ch 11 or 16. Alternatively telephone Tel +1 805 9898841 or Tel 9898843 from 0600–1800 LT. After 1800 LT telephone Tel +1 805 8160792 or Tel +1 805 989 1470 (recorded message). If you are unable to contact PLEAD CONTROL, contact SAN PEDRO TRAFFIC Traffic on VHF Ch 14 or Tel +1 310 8326411 for the most recent information regarding hazardous military operations.

The Navy requests all vessels transiting the range to submit a notification to PLEAD CONTROL indicating the vessel name, destination and estimated time of entry into and departure from the test range. Notifications can be faxed to +1 805 9890102.

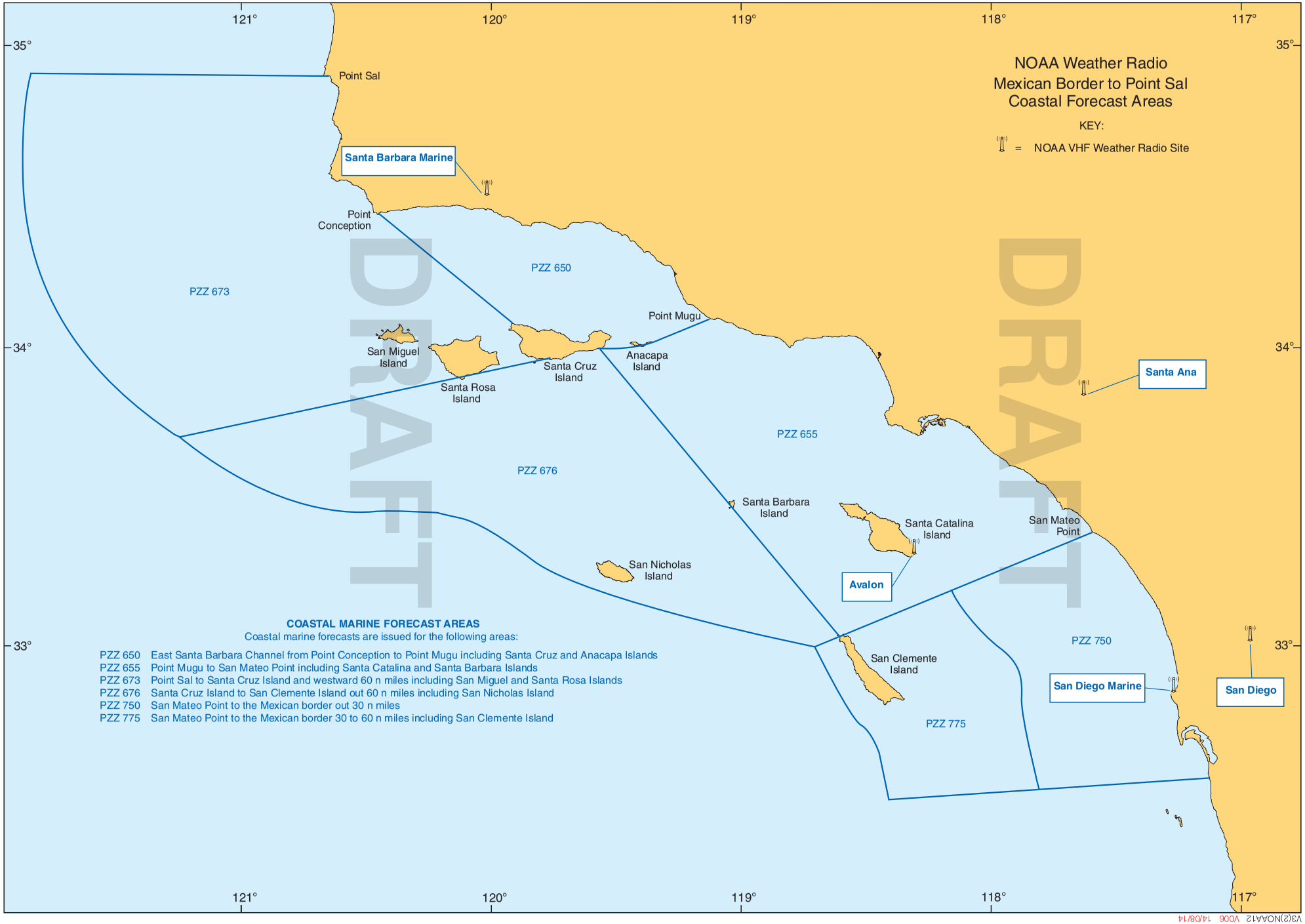
FIRING PRACTICE AREA - SAN CLEMENTE ISLAND

Approximate Position: 32°55′·00N 118°30′·00W

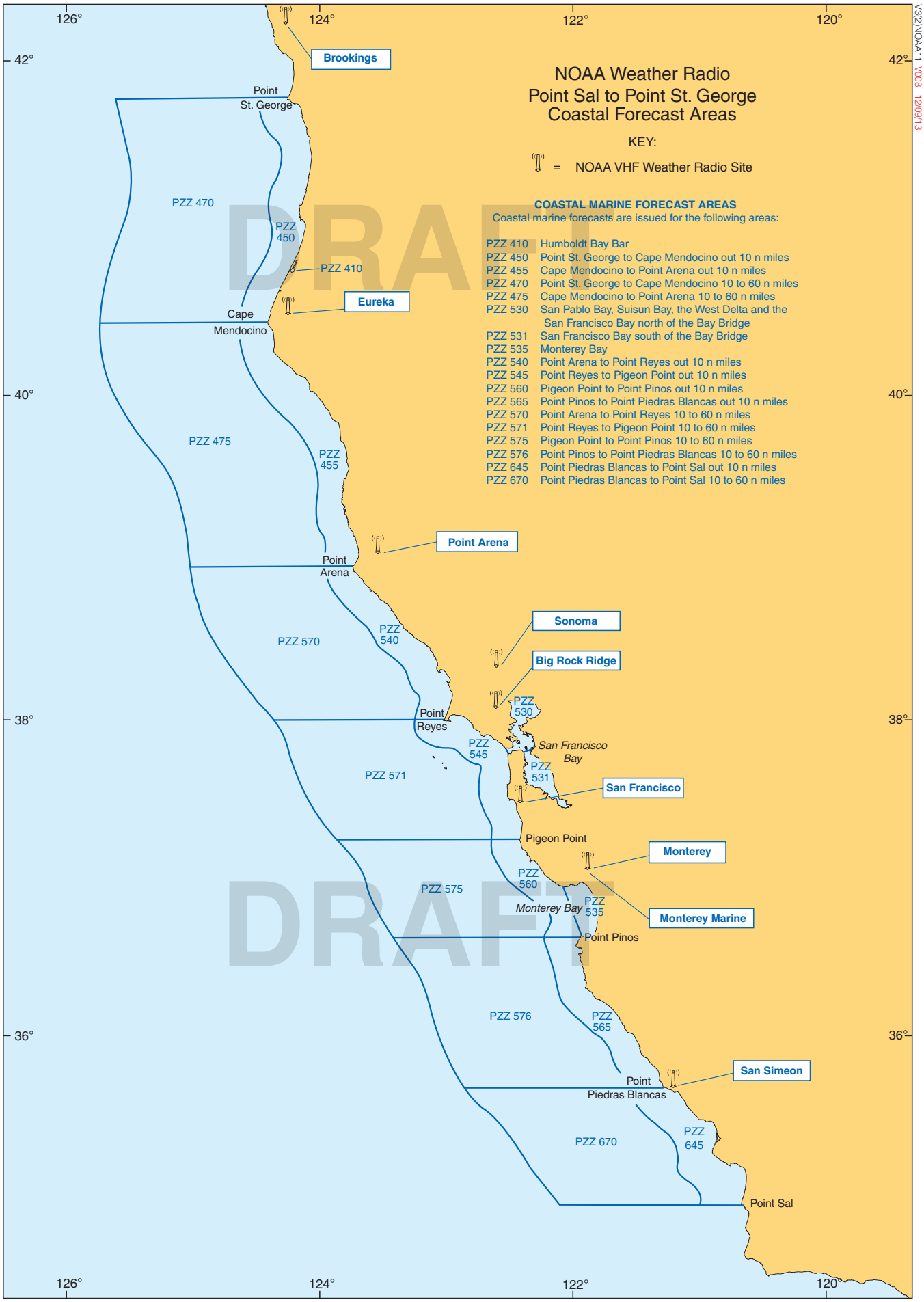
The vicinity of San Clemente Island, approximate position 32°55´N 118°30´W, includes restricted waters that can be hazardous at any time due to extremely dangerous naval activities. Mariners should refer to http://www.scisland.org for up to date information regarding the currently active Restricted Areas, which limit public access in the eight zones surrounding San Clemente. It should be noted however, that due to the dynamic nature of operations, all schedules are subject to change.

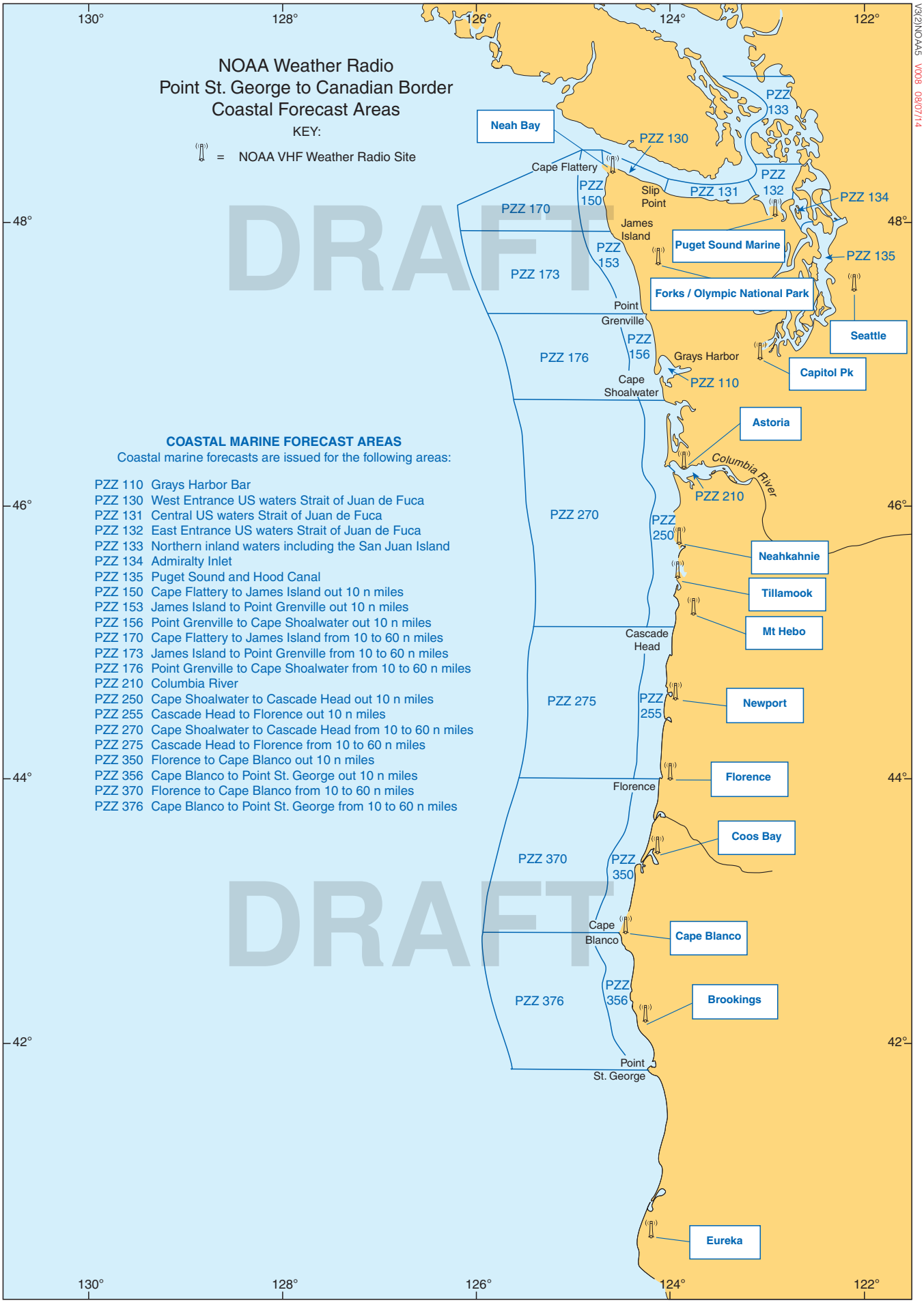
Safety Zone Section G (out to 3 n miles) and the Wilson Cove Security Zone (out to 1·5 n miles) are always restricted. For Wilson Cove, mariners can only transit outside of the 1·5 n mile restricted area, but for Section G, permission to transit may be granted on a case-by-case basis by contacting San Clemente Island – see details below. Mariners may sign up for updated Twitter feeds for safety zone changes, in addition to the published details on the website above. They can also verify the real-time status of the restricted waters by contacting either KRAKEN watch floor – see details below – or calling Coast Guard Sector San Diego Joint Harbour Operations Centre on VHF Ch 16 or telephone on +1 619 2787033. It should be noted that violation of the restricted areas will be subject to severe civil and/or criminal felony penalties.

Mariners must monitor VHF Ch 82A when transiting the area. San Clemente Island's Fleet Area Control and Surveillance Facility (FACSFAC), called KRAKEN watch floor, can be reached on VHF Ch 82A using call sign STONEHENGE or by telephone on +1 619 5454752 Monday – Friday 0700 to 1900 (1600 on Fridays) LT. FACSFAC San Diego watch floor, call sign BEAVER, supports KRAKEN watch duties outside of these hours and at weekends. Mariners should contact the range control centre, using the relevant call sign, to seek authorisation to transit through Section G of the Safety Zone. If a Section of the island shown on the website is green, there is no need to gain permission to anchor, fish or use that particular area.



V3(2)NOAA12 V006 14/08/14


NOAA Weather Radio
Point Sal to Point St. George
Coastal Forecast Areas
KEY:
= NOAA VHF Weather Radio Site
COASTAL MARINE FORECAST AREAS
Coastal marine forecasts are issued for the following areas:
PZZ 410 Humboldt Bay Bar
PZZ 450 Point St. George to Cape Mendocino out 10 n miles
PZZ 455 Cape Mendocino to Point Arena out 10 n miles
PZZ 470 Point St. George to Cape Mendocino 10 to 60 n miles
PZZ 475 Cape Mendocino to Point Arena 10 to 60 n miles
PZZ 530 San Pablo Bay, Suisun Bay, the West Delta and the San Francisco Bay north of the Bay Bridge
PZZ 531 San Francisco Bay south of the Bay Bridge
PZZ 535 Monterey Bay
PZZ 540 Point Arena to Point Reyes out 10 n miles
PZZ 545 Point Reyes to Pigeon Point out 10 n miles
PZZ 560 Pigeon Point to Point Pinos out 10 n miles
PZZ 565 Point Pinos to Point Piedras Blancas out 10 n miles
PZZ 570 Point Arena to Point Reyes 10 to 60 n miles
PZZ 571 Point Reyes to Pigeon Point 10 to 60 n miles
PZZ 575 Pigeon Point to Point Pinos 10 to 60 n miles
PZZ 576 Point Pinos to Point Piedras Blancas 10 to 60 n miles
PZZ 645 Point Piedras Blancas to Point Sal out 10 n miles
PZZ 670 Point Piedras Blancas to Point Sal 10 to 60 n miles
Brookings
Eureka
Point Arena
Sonoma
Big Rock Ridge
San Francisco
Monterey
Monterey Marine
San Simeon
Point St. George
Cape Mendocino
Point Arena
Point Reyes
Pigeon Point
Point Pinos
Point Piedras Blancas
Point Sal
San Francisco Bay
Monterey Bay
PZZ 470
PZZ 450
PZZ 410
PZZ 475
PZZ 455
PZZ 570
PZZ 540
PZZ 530
PZZ 545
PZZ 531
PZZ 571
PZZ 560
PZZ 575
PZZ 535
PZZ 576
PZZ 565
PZZ 670
PZZ 645
126°
124°
122°
120°
42°
40°
38°
36°
DRAFT
V3(2)NOAA11 V008 12/09/13

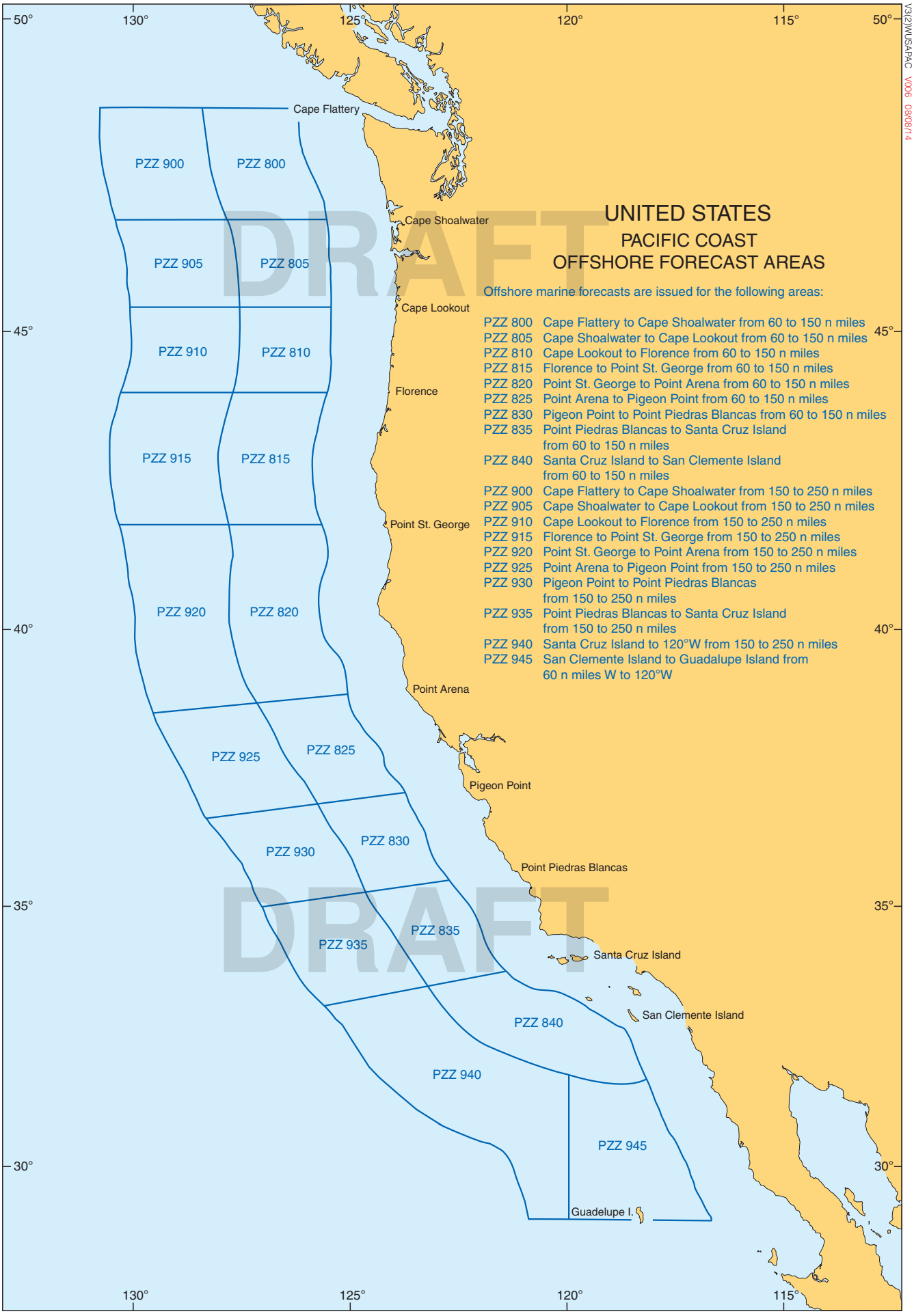


COASTAL MARINE FORECAST AREAS

Coastal marine forecasts are issued for the following areas:

PZZ 110 Grays Harbor Bar
PZZ 130 West Entrance US waters Strait of Juan de Fuca
PZZ 131 Central US waters Strait of Juan de Fuca
PZZ 132 East Entrance US waters Strait of Juan de Fuca
PZZ 133 Northern inland waters including the San Juan Island
PZZ 134 Admiralty Inlet
PZZ 135 Puget Sound and Hood Canal
PZZ 150 Cape Flattery to James Island out 10 n miles
PZZ 153 James Island to Point Grenville out 10 n miles
PZZ 156 Point Grenville to Cape Shoalwater out 10 n miles
PZZ 170 Cape Flattery to James Island from 10 to 60 n miles
PZZ 173 James Island to Point Grenville from 10 to 60 n miles
PZZ 176 Point Grenville to Cape Shoalwater from 10 to 60 n miles
PZZ 210 Columbia River
PZZ 250 Cape Shoalwater to Cascade Head out 10 n miles
PZZ 255 Cascade Head to Florence out 10 n miles
PZZ 270 Cape Shoalwater to Cascade Head from 10 to 60 n miles
PZZ 275 Cascade Head to Florence from 10 to 60 n miles
PZZ 350 Florence to Cape Blanco out 10 n miles
PZZ 356 Cape Blanco to Point St. George out 10 n miles
PZZ 370 Florence to Cape Blanco from 10 to 60 n miles
PZZ 376 Cape Blanco to Point St. George from 10 to 60 n miles

V3(2)NOAA5 V008 08/07/14

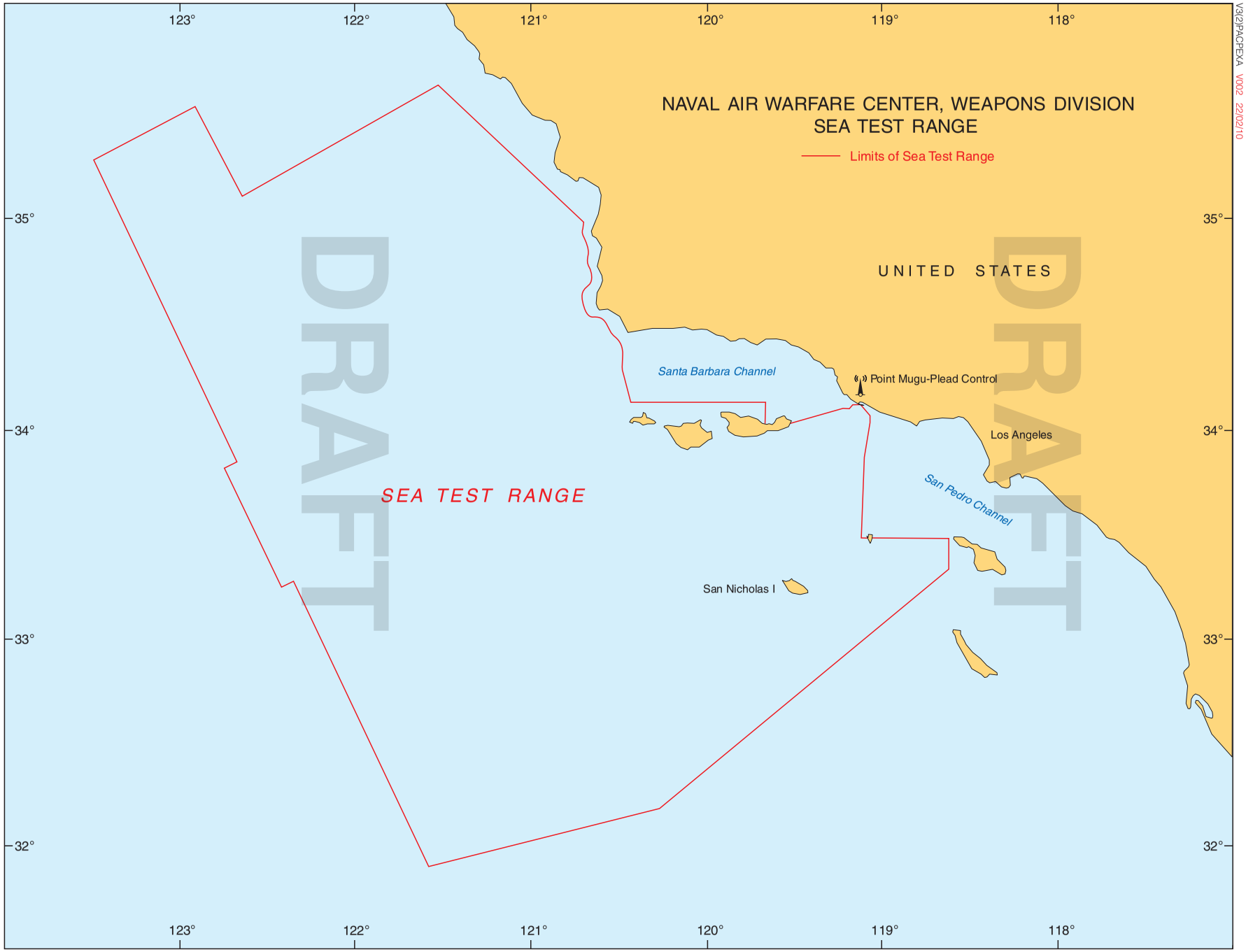


UNITED STATES
PACIFIC COAST
OFFSHORE FORECAST AREAS

Offshore marine forecasts are issued for the following areas:

PZZ 800 Cape Flattery to Cape Shoalwater from 60 to 150 n miles
PZZ 805 Cape Shoalwater to Cape Lookout from 60 to 150 n miles
PZZ 810 Cape Lookout to Florence from 60 to 150 n miles
PZZ 815 Florence to Point St. George from 60 to 150 n miles
PZZ 820 Point St. George to Point Arena from 60 to 150 n miles
PZZ 825 Point Arena to Pigeon Point from 60 to 150 n miles
PZZ 830 Pigeon Point to Point Piedras Blancas from 60 to 150 n miles
PZZ 835 Point Piedras Blancas to Santa Cruz Island from 60 to 150 n miles
PZZ 840 Santa Cruz Island to San Clemente Island from 60 to 150 n miles
PZZ 900 Cape Flattery to Cape Shoalwater from 150 to 250 n miles
PZZ 905 Cape Shoalwater to Cape Lookout from 150 to 250 n miles
PZZ 910 Cape Lookout to Florence from 150 to 250 n miles
PZZ 915 Florence to Point St. George from 150 to 250 n miles
PZZ 920 Point St. George to Point Arena from 150 to 250 n miles
PZZ 925 Point Arena to Pigeon Point from 150 to 250 n miles
PZZ 930 Pigeon Point to Point Piedras Blancas from 150 to 250 n miles
PZZ 935 Point Piedras Blancas to Santa Cruz Island from 150 to 250 n miles
PZZ 940 Santa Cruz Island to 120°W from 150 to 250 n miles
PZZ 945 San Clemente Island to Guadalupe Island from 60 n miles W to 120°W

V3(2)WUSAPAC V006 08/08/14


NAVAL AIR WARFARE CENTER, WEAPONS DIVISION
SEA TEST RANGE
Limits of Sea Test Range
UNITED STATES
SEA TEST RANGE
Santa Barbara Channel
Point Mugu-Plead Control
Los Angeles
San Pedro Channel
San Nicholas I
123°
122°
121°
120°
119°
118°
35°
34°
33°
32°
DRAFT
V3(2)PACPEXA V002 22/02/10

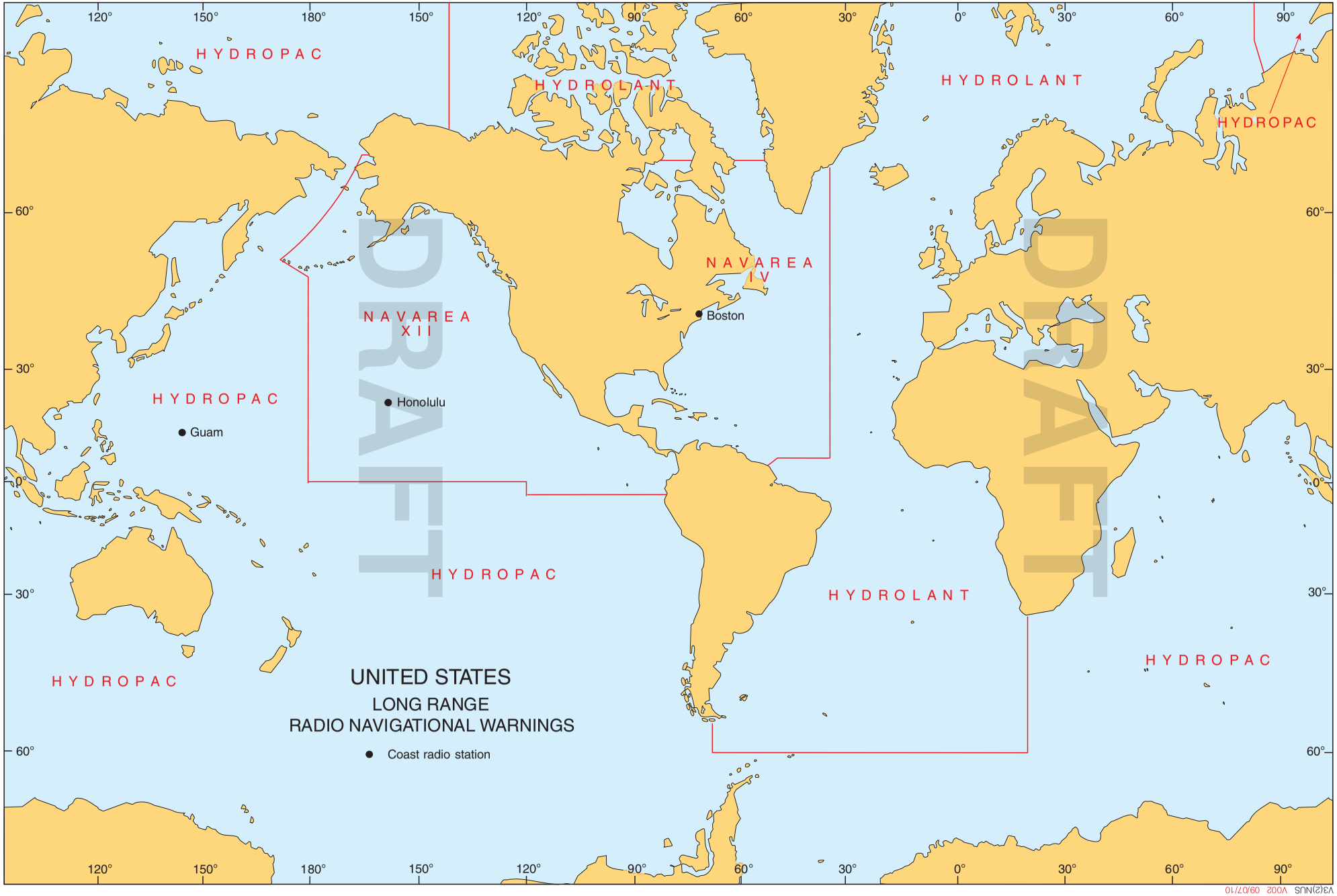
UNITED STATES (Pacific Coast)

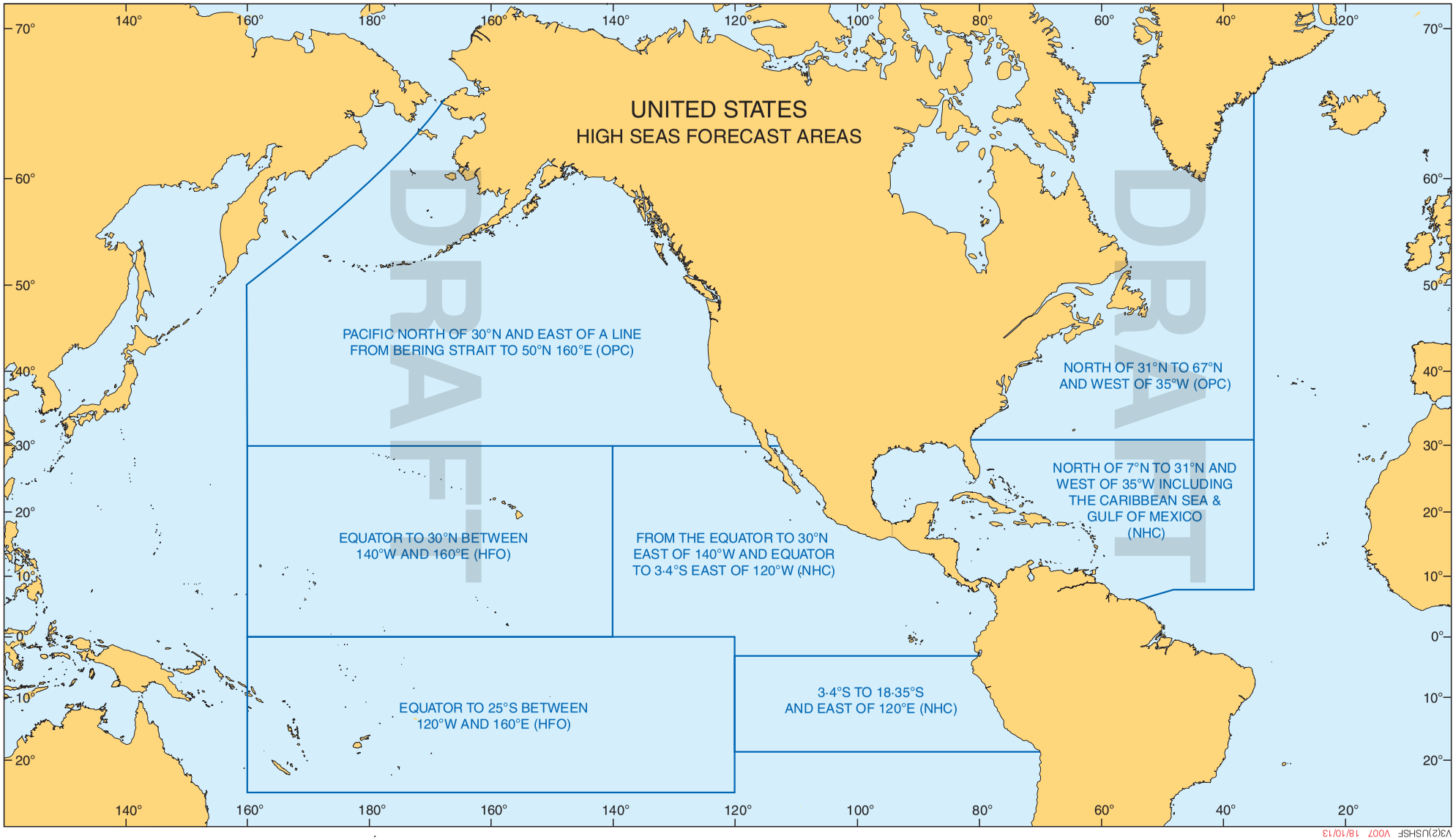
COLUMBIA RIVER SECTOR (US COAST GUARD)				
Control Centre: 46°09′·25N 123°53′·10W				
	Ch 22A	VHF		46°09′·25N 123°53′·10W
Diagram page 261				
Weather Bulletins				
0533 1733	Weather forecasts for the coastal area on the approach and entrance to, the Columbia River.			
1745	Local weather for the Columbia River.			
Navigational Warnings				
0533 1733	Storm and local Navigational Warnings for the coastal area on the approach and entrance to, the Columbia River, immediately following the Weather Bulletins.			
On receipt 1745	Storm and local Navigational Warnings for the Columbia River, immediately following the Weather Bulletins.			
NOTE(S): Transmission of certain Navigational Warnings e.g. firing practice, ship launches etc., may be made more frequently than the times listed, at the discretion of the Coast Guard.				

HUMBOLDT BAY SECTOR (US COAST GUARD)				
Control Centre: 40°45′·99N 124°13′·11W				
	Ch 22A	VHF		40°45′·99N 124°13′·11W
Diagrams pages 260, 261 and 262				
Weather Bulletins				
1615 2315	Local weather and offshore forecasts.			
Navigational Warnings				
On receipt 1615 2315	Storm and local Navigational Warnings.			

KKL RADIO - VASHON ISLAND [1150]			
Control Centre: 47°22′·25N 122°29′·27W			
	Transmits	Receives	
KKL23	13173	13173	
KKL24	4015	4015	
KKL28	8182	8182	
Diagrams pages 262, 265 and 266			
Weather Bulletins			
On request (H24)	Weather reports for the Gulf of Alaska and Bering Sea to the International Dateline, coasts of Washington and Oregon out to 250 n miles, North Pacific to 55°N, west to 180° and south to Equator.		
Navigational Warnings			
On request (H24)	Local warnings for Washington and Oregon coastal waters. Ice Reports for Alaskan coastal waters.		
NOTE(S): This station provides Data Service (HF)			

LOS ANGELES - LONG BEACH SECTOR (US COAST GUARD)				
Control Centre: 33°43′·60N 118°16′·10W				
	Ch 22A	VHF		33°43′·60N 118°16′·10W
Diagrams pages 259 and 262				
Weather Bulletins				
0200 1800	Local weather and offshore forecasts.			
Navigational Warnings				
On receipt 0200 1800	Storm and local Navigational Warnings.			


HYDROPAC
HYDROLANT
HYDROLANT
HYDROPAC
NAVAREA XII
NAVAREA IV
Boston
Honolulu
Guam
HYDROPAC
HYDROPAC
HYDROLANT
HYDROPAC
HYDROPAC
UNITED STATES
LONG RANGE
RADIO NAVIGATIONAL WARNINGS
Coast radio station
DRAFT
DRAFT
120° 150° 180° 150° 120° 90° 60° 30° 0° 30° 60° 90°
60°
30°
0°
30°
60°
V3(2)NUS V002 09/07/10


UNITED STATES
HIGH SEAS FORECAST AREAS
PACIFIC NORTH OF 30°N AND EAST OF A LINE FROM BERING STRAIT TO 50°N 160°E (OPC)
NORTH OF 31°N TO 67°N AND WEST OF 35°W (OPC)
NORTH OF 7°N TO 31°N AND WEST OF 35°W INCLUDING THE CARIBBEAN SEA & GULF OF MEXICO (NHC)
EQUATOR TO 30°N BETWEEN 140°W AND 160°E (HFO)
FROM THE EQUATOR TO 30°N EAST OF 140°W AND EQUATOR TO 3·4°S EAST OF 120°W (NHC)
EQUATOR TO 25°S BETWEEN 120°W AND 160°E (HFO)
3·4°S TO 18·35°S AND EAST OF 120°E (NHC)
DRAFT
V3(2)USHSF V007 18/10/13

UNITED STATES (Pacific Coast)

NORTH BEND SECTOR (US COAST GUARD)				
Control Centre: 43°24′·66N 124°14′·52W				
	Ch 22A	VHF		
Diagrams pages 261 and 262				
Weather Bulletins				
0603 1803	Local weather and offshore forecasts.			
Navigational Warnings				
On receipt 0603 1803	Storm and local Navigational Warnings, immediately following the Weather bulletins.			
NOTE(S): Transmission of certain Navigational Warnings e.g. firing practice, ship launches etc., may be made more frequently than the times listed, at the discretion of the Coast Guard.				

POINT REYES RCF (NMC)				
Control Centre: 37°55′·53N 122°43′·87W				
A	8416·5 16806·5	RADIO-TELEX		
B	4426 *(Ch 424)*	RT (HF)		
C	8764 *(Ch 816)* 13089 *(Ch 1205)*			
D	17314 *(Ch 1625)*			
Diagrams pages 262, 265 and 266				
Weather Bulletins				
A: 0015 1730	High Seas forecast for NE Pacific – Equator to 30°N and E of 140°W, and Mid Pacific.			
B: 0430 1030 **C:** 0430 1030 1630 2230 **D:** 1630 2230	Offshore forecasts for Sea Areas 81–85. High Seas forecast for NE Pacific – Equator to 30°N and E of 140°W.			
Navigational Warnings				
A: 0015 1730	NAVAREA XII warnings. Electronic Navigation Advisories.			
NOTE(S): 1. The carrier frequency is 1·7 kHz below the assigned frequency shown. 2. Broadcasts are remotely controlled from COMMCOM.				

SAN DIEGO SECTOR (US COAST GUARD)				
Control Centre: 32°43′·59N 117°10′·99W				
	Ch 22A	VHF		32°43′·59N 117°10′·99W
Diagram page 259				
Navigational Warnings				
On receipt	Storm and local Navigational Warnings.			

SAN FRANCISCO SECTOR (US COAST GUARD)				
Control Centre: 37°48′·58N 122°21′·70W				
	Ch 22A	VHF		37°48′·58N 122°21′·70W
Diagrams pages 260 and 262				
Weather Bulletins				
1630 1900 2130[1]	Local weather and offshore forecasts.			
Navigational Warnings				
On receipt 1630 1900 2130[1]	Storm and local Navigational Warnings.			
[1] 2130 broadcast in winter only				

UNITED STATES (Pacific Coast)

SEATTLE (KLB) [1113]				
Control Centre: 48°12′·00N 122°14′·00W				
A	4405 *(Ch 417)* 8731 *(Ch 805)* 13101 *(Ch 1209)* 17311 *(Ch 1624)*	RT (HF)		
B	6318 *(Ch 608)* 12590·5 *(Ch 1223)*	RADIO-TELEX		
Diagrams pages 262, 265 and 266				
Weather Bulletins				
A: 0800 1500 2000	Forecast for East Pacific.			
A: 0800 1500	Forecast for Alaska Offshore.			
B: On request (H24) using command "WX+"	National Weather Service products. This service is chargeable.			
NOTE(S): Remotely controlled by Mobile (WLO).				

SEATTLE (PUGET SOUND) SECTOR (US COAST GUARD)				
Control Centre: 47°35′·39N 122°20′·30W				
Northern section				
A	Ch 22A	VHF	Bahoukus Peak	48°22′·24N 124°40′·38W
Southern section				
B	Ch 22A	VHF	South Mountain	47°18′·98N 123°21′·47W
Diagram page 261				
Weather Bulletins				
A: 0615 1815	Local weather.			
B: 0630 1830	Local weather.			
Navigational Warnings				
A: On receipt 0615 1815	Storm and local Navigational Warnings for Puget Sound, immediately follow the Weather Bulletins.			
B: On receipt 0630 1830	Storm and local Navigational Warnings for Puget Sound, immediately follow the Weather Bulletins.			
NOTE(S): Transmission of certain Navigational Warnings e.g. firing practice, ship launches etc., may be made more frequently than the times listed, at the discretion of the Coast Guard.				

URUGUAY

GENERAL NOTES

Maritime Safety Information (MSI) broadcasts

Storm warnings, weather bulletins, Navigational Warnings and water level reports are announced by Uruguayan Maritime Radio Stations and Prefectura Radio Stations on 2182 kHz or VHF Ch 16 before being broadcast on the scheduled frequency or channel.

Full details of the Uruguayan **Maritime Movement Control and Information System**, which includes MSI broadcasts, can be found in ALRS Volume 6(7) (NP286(7)).

INTERNET WEATHER SERVICES	
Uruguayan Navy Oceanographic, Hydrographic and Meteorological Service www.armada.mil.uy/Pagina/institucion/dimat/sohma/informacion-meteorologica.html	Daily weather forecasts.

NAVTEX			
F	La Paloma	518 kHz	34°39′·26S 54°08′·56W
A		490 kHz	
Diagrams pages 41 and 270			
Weather Bulletins			
F: 0050 0450 0850 1250 1650 2050	Gale warnings and weather forecast for Sea Areas B and C in English.		
A: 0000 0400 0800 1200 1600 2000	Gale warnings and weather forecast for Sea Areas B and C in Spanish.		

Continued on next page

URUGUAY

NAVTEX (Continued)

Navigational Warnings	
F: 0050 0450 0850 1250 1650 2050	Local warnings in English.
A: 0000 0400 0800 1200 1600 2000	Local warnings in Spanish.
NOTE: Temporarily inoperative until further notice.	

MARITIME SAFETY INFORMATION (MSI) ON THE INTERNET

The internet is not part of the Maritime Safety Information system and should never be relied upon as the only means to obtain the latest forecast and warning information. Access to the service may be interrupted or delayed from time to time, updates may also be delayed. Please refer to GMDSS services, INMARSAT SafetyNET or international NAVTEX for the latest information. However, the following website(s) may prove useful to the mariner:

http://www.armada.mil.uy/Pagina/institucion/dimat/sohma/avisos-a-los-navegantes.html	Uruguayan Navy	Navigation Warnings in Spanish.

CARMELO (PREFECTURA RADIO) (CWC22)

Control Centre: 34°00′·58S 58°17′·73W

	Ch 15	VHF		
Diagram page 270				
Weather Bulletins				
0303 1503 2133	Weather bulletins.			
Navigational Warnings				
0303 1503 2133	Navigational Warnings.			

COLONIA (PREFECTURA RADIO) (CWC23)

Control Centre: 34°28′·47S 57°50′·63W

	Ch 15	VHF		
Diagram page 270				
Weather Bulletins				
0330 1330 2100	Weather bulletins.			
Navigational Warnings				
0330 1330 2100	Navigational Warnings.			

FRAY BENTOS (PREFECTURA RADIO) (CWC25)

Control Centre: 33°07′·34S 58°18′·82W

	Ch 15	VHF		
Diagram page 270				
Weather Bulletins				
0500 1100 1700 2300	Weather bulletins.			
Navigational Warnings				
0500 1100 1700 2300	Navigational Warnings.			

LA PALOMA (PREFECTURA RADIO) (CWC30)

Control Centre: 34°39′·26S 54°08′·56W

	2722·1	RT (MF)		
	Ch 15	VHF		
Diagram page 270				
Weather Bulletins				
0303 1533 2303	Weather bulletins.			
Navigational Warnings				
0303 1533 2303	Navigational Warnings.			


30°
35°
40°
45°
50°
55°
60°
65°
E
Río Grande del Sur
C
Litoral Atlantico Uruguayo
D
Provincia de Buenos Aires
B
A
Río Uruguay
Río de la Plata
URUGUAY
FORECAST AREAS
DRAFT
DRAFT

URUGUAY

MONTEVIDEO (TROUVILLE) (PREFECTURA RADIO) (CWC39)				
Control Centre: 34°52′·00S 56°18′·66W				
	4146	RT (HF)		
	Ch 15	VHF		
Diagram page 270				
Weather Bulletins				
0103 1133 1903	Weather bulletins.			
Navigational Warnings				
0103 1133 1903	Navigational Warnings.			

MONTEVIDEO CENTRO DE CONTROL PREFECTURA RADIO (CWC)				
Control Centre: 34°54′·27S 56°12′·75W				
	Ch 15	VHF		
Diagram page 270				
Weather Bulletins				
0833 1603 2203	Weather bulletins.			
Navigational Warnings				
0833 1603 2203	Navigational Warnings.			

NUEVA PALMIRA (PREFECTURA RADIO) (CWC31)				
Control Centre: 33°52′·70S 58°25′·20W				
	Ch 15	VHF		
Diagram page 270				
Weather Bulletins				
0300 0900 1500 2100	Weather bulletins.			
Navigational Warnings				
0300 0900 1500 2100	Navigational Warnings.			

PAYSANDÚ (PREFECTURA RADIO) (CWC32)				
Control Centre: 32°18′·10S 58°05′·10W				
	Ch 15	VHF		
Diagram page 270				
Weather Bulletins				
0300 0900 1500 2100	Weather bulletins.			
Navigational Warnings				
0300 0900 1500 2100	Navigational Warnings.			

PIRIÁPOLIS (PREFECTURA RADIO) (CWC33)				
Control Centre: 34°52′·70S 55°16′·42W				
	Ch 15	VHF		
Diagram page 270				
Weather Bulletins				
0703 1333 2133	Weather bulletins.			
Navigational Warnings				
0703 1333 2133	Navigational Warnings.			

PUERTO SAUCE (PREFECTURA RADIO) (CWC27)				
Control Centre: 34°26′·07S 57°26′·18W				
	Ch 15	VHF		
Diagram page 270				
Weather Bulletins				
0133 1303 1933	Weather bulletins.			

Continued overleaf

URUGUAY

PUERTO SAUCE (PREFECTURA RADIO) (CWC27) (Continued)

Navigational Warnings	
0133 1303 1933	Navigational Warnings.

PUNTA DEL ESTE (PREFECTURA RADIO) (CWC34)

Control Centre: 34°57′·87S 54°57′·08W

	2722·1	RT (MF)		
	Ch 15	VHF		

Diagram page 270

Weather Bulletins	
0133 1503 2133	Weather bulletins.
Navigational Warnings	
0133 1503 2133	Navigational Warnings.

VANUATU

INTERNET WEATHER SERVICES

Vanuatu Meteorological Services www.meteo.gov.vu	Coastal and high seas synopsis, forecasts and warnings, in English.

PORT-VILA (YJM)

Control Centre: 17°43′·49S 168°18′·04E

	4385·3	RT (HF)		

Weather Bulletins	
On receipt after announcement on 4125 and 6215 kHz	Storm warnings, repeated during the period of validity.
0900 1600 LT	Gale warnings and forecast for local waters in French, English and Bislama.

VIETNAM

INTERNET WEATHER SERVICES

National Centre for Hydro-Meteorological Forecasting www.nchmf.gov.vn	Marine weather forecasts in English and Vietnamese.

NAVTEX

K	Đa Nang	518 kHz	16°03′·53N 108°12′·53E
X	Ho Chi Minh		10°23′·67N 107°08′·68E
F	Đa Nang	490 kHz	16°03′·53N 108°12′·53E
V	Vung Tau		10°23′·67N 107°08′·68E
M	Hai Phong	4209·5 kHz	20°51′·02N 106°44′·02E
C	Nha Trang		12°13′·33N 109°10′·83E

Diagrams pages 37 and 274

Weather Bulletins	
K: 0140 1340	Weather bulletins in English.
X: 1150 2350	
F: 0050 1250	Weather bulletins in Vietnamese.
V: 1130 2330	
M: 1000 2200	Weather bulletins in English and Vietnamese.
C: 0020 1220	
Navigational Warnings	
K: 0540 0940 1740 2140	Navigational Warnings in English.
X: 0350 0750 1550 1950	

Continued on next page

F: 0450 0850 1650 2050	Navigational Warnings in Vietnamese.
V: 0330 0730 1530 1930	
M: 0200 0600 1400 1800	Navigational Warnings in English and Vietnamese.
C: 0420 0820 1620 2020	

MARITIME SAFETY INFORMATION (MSI) ON THE INTERNET

The internet is not part of the Maritime Safety Information system and should never be relied upon as the only means to obtain the latest forecast and warning information. Access to the service may be interrupted or delayed from time to time, updates may also be delayed. Please refer to GMDSS services, INMARSAT SafetyNET or international NAVTEX for the latest information. However, the following website(s) may prove useful to the mariner:

www.vms-south.vn/en	Southern Vietnam Maritime Safety Corporation	Notices to Mariners and associated information, in English and Vietnamese.
www.vms-north.vn/home	Northern Vietnam Maritime Safety Corporation	Notices to Mariners and associated information, in English and Vietnamese.

BAC LIEU

Control Centre: 9°41′·20N 106°34′·53E

	Ch 18	VHF	Bac Lieu	9°41′·20N 106°34′·53E
Diagram page 274				
Weather Bulletins				
Every odd hour H+05	Meteorological and other warnings in Vietnamese and English.			
1105 2305	Weather bulletins in Vietnamese.			

BACH LONG VI

Control Centre: 20°08′·00N 107°43′·42E

	Ch 18	VHF	Bach Long Vi	20°08′·00N 107°43′·42E
Diagram page 274				
Weather Bulletins				
Every even hour H+50	Meteorological and other warnings in Vietnamese and English.			
0050 1250	Weather bulletins in Vietnamese.			

BEN THUY (XVB)

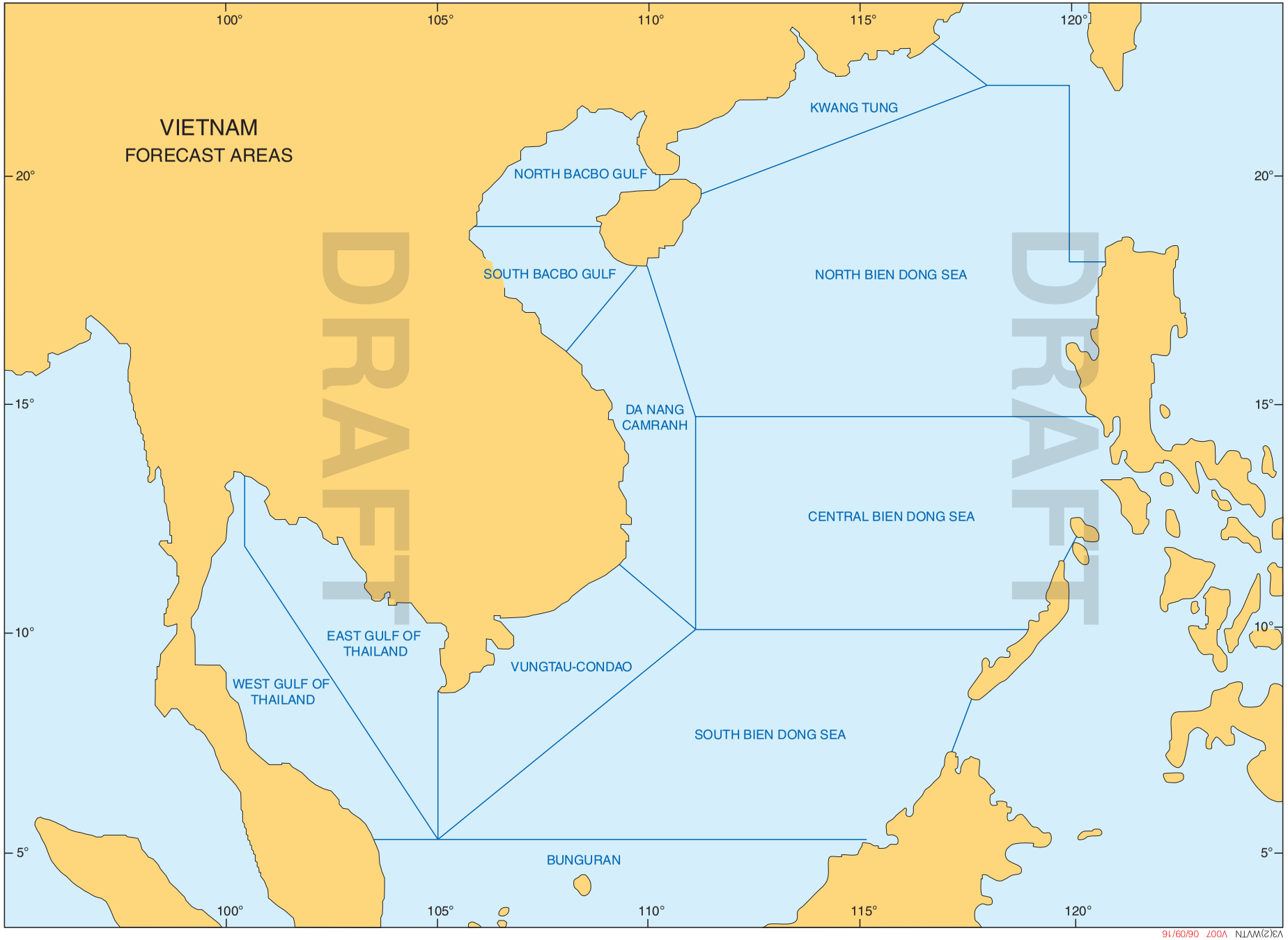
Control Centre: 18°47′·68N 105°43′·82E

A	7906	RT (HF)	Ben Thuy	18°47′·68N 105°43′·82E
B	Ch 18	VHF		
Diagram page 274				
Weather Bulletins				
A: Every even hour H+50 **B:** Every odd hour H+50	Meteorological and other warnings in Vietnamese and English.			
A: 0050 1250 **B:** 1150 2350	Weather bulletins in Vietnamese.			

CA MAU (XVA)

Control Centre: 9°11′·33N 105°08′·00E

A	7906	RT (HF)	Ca Mau	9°11′·33N 105°08′·00E
B	Ch 18	VHF		
Diagram page 274				
Weather Bulletins				
A: Every odd hour H+35 **B:** Every odd hour H+50	Meteorological and other warnings in Vietnamese and English.			
A: 1135 2335 **B:** 1150 2350	Weather bulletins in Vietnamese.			



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VIETNAM

CAM RANH				
Control Centre: 12°04′·83N 109°10′·90E				
	Ch 18	VHF	Cam Ranh	12°04′·83N 109°10′·90E
Diagram page 274				
Weather Bulletins				
Every even H+40	Meteorological and other warnings in Vietnamese and English.			
0040 1240	Weather bulletins in Vietnamese.			

CAN THO (XVU)				
Control Centre: 10°04′·30N 105°45′·52E				
A	7906	RT (HF)	Can Tho	10°04′·30N 105°45′·52E
B	Ch 18	VHF		
Diagram page 274				
Weather Bulletins				
A: Every even hour H+05 **B:** Every odd hour H+20	Meteorological and other warnings in Vietnamese and English.			
A: 0205 1405 **B:** 1120 2320	Weather bulletins in Vietnamese.			

CON DAO				
Control Centre: 8°40′·88N 106°36′·33E				
	Ch 18	VHF	Con Dao	8°40′·88N 106°36′·33E
Diagram page 274				
Weather Bulletins				
Every odd hour H+35	Meteorological and other warnings in Vietnamese and English.			
1135 2335	Weather bulletins in Vietnamese.			

CUA ONG (XVC)				
Control Centre: 21°01′·73N 107°22′·20E				
	Ch 18	VHF	Cua Ong	21°01′·73N 107°22′·20E
Diagram page 274				
Weather Bulletins				
Every odd hours H+05	Meteorological and other warnings in Vietnamese and English.			
1105 2305	Weather bulletins in Vietnamese.			

CUA VIET				
Control Centre: 16°54′·95N 107°10′·84E				
	Ch 18	VHF	Cua Viet	16°54′·95N 107°10′·84E
Diagram page 274				
Weather Bulletins				
Every even hour H+55	Meteorological and other warnings in Vietnamese and English.			
1055 2255	Weather bulletins in Vietnamese.			

ĐA NANG (XVT)				
Control Centre: 16°03′·53N 108°12′·53E				
A	7906 8294	RT (HF)	Da Nang HF	16°03′·53N 108°12′·53E
B	Ch 18	VHF	Da Nang VHF	16°07′·93N 108°15′·10E
Diagram page 274				
Weather Bulletins				
A: Every even hour H+35 **B:** Every even hour H+40	Meteorological and other warnings in Vietnamese and English.			
A: 0035 1235 **B:** 0040 1240	Weather bulletins in Vietnamese.			

VIETNAM

DUNG QUAT				
Control Centre: 15°28′·62N 108°41′·50E				
	Ch 18	VHF	Dung Quat	15°28′·62N 108°41′·50E
Diagram page 274				
Weather Bulletins				
Every odd hour H+25	Meteorological and other warnings in Vietnamese and English.			
1125 2325	Weather bulletins in Vietnamese.			

HA TIEN				
Control Centre: 10°08′·62N 104°36′·07E				
	Ch 18	VHF	Ha Tien	10°08′·62N 104°36′·07E
Diagram page 274				
Weather Bulletins				
Every even hour H+20	Meteorological and other warnings in Vietnamese and English.			
0020 1220	Weather bulletins in Vietnamese.			

HAI PHONG (XVG)				
Control Centre: 20°50′·92N 106°41′·32E				
A	7906 8294	RT (HF)	Hai Phong MF/HF	20°50′·92N 106°41′·32E
B	Ch 18	VHF	Hai Phong VHF	20°47′·83N 106°42′·90E
Diagram page 274				
Weather Bulletins				
A, B: Every even hour H+05	Meteorological and other warnings in Vietnamese and English.			
A, B: 0005 1205	Weather bulletins in Vietnamese.			

HO CHI MINH (XVS)				
Control Centre: 10°45′·57N 106°42′·83E				
A	7906 8294	RT (HF)	Ho Chi Minh (HF aerial)	10°23′·67N 107°08′·68E
B	Ch 18	VHF	Ho Chi Minh (VHF aerial)	10°42′·20N 106°43′·67E
Diagram page 274				
Weather Bulletins				
A, B: Every odd hour H+05	Meteorological and other warnings in Vietnamese and English.			
A, B: 0105 1305	Weather bulletins in Vietnamese.			

HON GAI (XVQ)				
Control Centre: 20°56′·97N 107°07′·25E				
A	7906	RT (HF)	Hôn Gai (Quang Ninh)	20°56′·97N 107°07′·25E
B	Ch 18	VHF		
Diagram page 274				
Weather Bulletins				
A: Every odd hour H+05 **B:** Every odd hour H+20	Meteorological and other warnings in Vietnamese and English.			
A: 1105 2305 **B:** 1120 2320	Weather bulletins in Vietnamese.			

HON LA				
Control Centre: 18°06′·00N 106°23′·00E				
	Ch 18	VHF	Hon La	18°06′·00N 106°23′·00E
Diagram page 274				
Weather Bulletins				
Every even hour H+05	Meteorological and other warnings in Vietnamese and English.			
0005 1205	Weather bulletins in Vietnamese.			

VIETNAM

HUÉ (XVD)				
Control Centre: 16°33′·03N 107°38′·78E				
A	7906	RT (HF)	Hué	16°33′·03N 107°38′·78E
B	Ch 18	VHF		
Diagram page 274				
Weather Bulletins				
A: Every even hour H+50 **B:** Every odd hour H+05	Meteorological and other warnings in Vietnamese and English.			
A: 1050 2250 **B:** 1105 2305	Weather bulletins in Vietnamese.			

KIEN GIANG (XVK)				
Control Centre: 9°59′·60N 105°05′·83E				
A	7906	RT (HF)	Kien Giang	9°59′·60N 105°05′·83E
B	Ch 18	VHF		
Diagram page 274				
Weather Bulletins				
A: Every even hour H+20 **B:** Every odd hour H+35	Meteorological and other warnings in Vietnamese and English.			
A: 1020 2220 **B:** 1135 2335	Weather bulletins in Vietnamese.			

LY SON				
Control Centre: 15°14′·50N 108°56′·40E				
	Ch 18	VHF	Ly Son	15°14′·50N 108°56′·40E
Diagram page 274				
Weather Bulletins				
Every odd hour H+40	Meteorological and other warnings in Vietnamese and English.			
1140 2340	Weather bulletins in Vietnamese.			

MONG CAI (XVM)				
Control Centre: 21°31′·56N 107°58′·09E				
A	7906	RT (HF)	Mong Cai	21°31′·56N 107°58′·09E
B	Ch 18	VHF		
Diagram page 274				
Weather Bulletins				
A: Every odd hour H+20 **B:** Every even hour H+20	Meteorological and other warnings in Vietnamese and English.			
A: 0120 1320 **B:** 1020 2220	Weather bulletins in Vietnamese.			

NHA TRANG (XVN)				
Control Centre: 12°13′·33N 109°10′·83E				
	7906	RT (HF)	Nha Trang HF aerial	12°13′·33N 109°10′·83E
Diagram page 274				
Weather Bulletins				
Every odd hour H+50	Meteorological and other warnings in Vietnamese and English.			
1150 2350	Weather bulletins in Vietnamese.			

VIETNAM

PHAN RANG				
Control Centre: 11°35′·38N 109°00′·53E				
A	7906	RT (HF)		
B	Ch 18	VHF		
Diagram page 274				
Weather Bulletins				
A: Every odd hour H+35 **B:** Every even hour H+05	Meteorological and other warnings in Vietnamese and English.			
A: 0135 1335 **B:** 0005 1205	Weather bulletins in Vietnamese.			

PHAN THIET (XVP)				
Control Centre: 10°55′·20N 108°06′·18E				
A	7906	RT (HF)		
B	Ch 18	VHF		
Diagram page 274				
Weather Bulletins				
A: Every odd hour H+50 **B:** Every odd hour H+05	Meteorological and other warnings in Vietnamese and English.			
A: 0150 1350 **B:** 1105 2305	Weather bulletins in Vietnamese.			

PHU QUOC				
Control Centre: 10°00′·73N 104°00′·76E				
	Ch 18	VHF	Phu Quoc	10°00′·73N 104°00′·76E
Diagram page 274				
Weather Bulletins				
Every even hour H+50	Meteorological and other warnings in Vietnamese and English.			
0050 1250	Weather bulletins in Vietnamese.			

PHU YEN (XVY)				
Control Centre: 13°07′·07N 109°18′·10E				
A	7906	RT (HF)	Phu Yen	12°53′·66N 109°27′·20E
B	Ch 18	VHF		
Diagram page 274				
Weather Bulletins				
A: Every odd hour H+20 **B:** Every odd hour H+35	Meteorological and other warnings in Vietnamese and English.			
A: 1120 2320 **B:** 1135 2335	Weather bulletins in Vietnamese.			

QUY NHON (XVI)				
Control Centre: 13°46′·68N 109°14′·28E				
A	7906	RT (HF)	Quy Nhon	13°46′·68N 109°14′·28E
B	Ch 18	VHF		
Diagram page 274				
Weather Bulletins				
A: Every even hour H+35 **B:** Every odd hour H+20	Meteorological and other warnings in Vietnamese and English.			
A: 1035 2235 **B:** 1120 2320	Weather bulletins in Vietnamese.			

VIETNAM

THANH HOA

Control Centre: 19°21′·13N 105°47′·52E

	Ch 18	VHF		

Diagram page 274

Weather Bulletins

Every odd hour H+35	Meteorological and other warnings in Vietnamese and English.
1135 2335	Weather bulletins in Vietnamese.

THO CHU

Control Centre: 10°22′·95N 104°26′·72E

	Ch 18	VHF	Tho Chu	10°22′·95N 104°26′·72E

Diagram page 274

Weather Bulletins

Every even hour H+35	Meteorological and other warnings in Vietnamese and English.
0035 1235	Weather bulletins in Vietnamese.

VUNG TAU (XVR)

Control Centre: 10°23′·67N 107°08′·68E

A	7906	RT (HF)		
B	Ch 18	VHF		

Diagram page 274

Weather Bulletins

A: Every even hour H+20 **B:** Every even hour H+50	Meteorological and other warnings in Vietnamese and English.
A: 0020 1220 **B:** 0050 1250	Weather bulletins in Vietnamese.

VIRGIN ISLANDS (UK)

INTERNET WEATHER SERVICES

Antigua and Barbuda Meteorological Service www.antiguamet.com	Local weather forecasts, including marine information, for the Leeward Islands.

ZBVI RADIO

Control Centre: 18°25′·45N 64°36′·25W

	780 kHz	AM		

Weather Bulletins

0805 LT[1] 0745 LT[2] 0945 LT[3]	Marine forecast for British Virgin Islands and NE Caribbean waters.

[1] Mon-Fri
[2] Sat
[3] Sun

VIRGIN ISLANDS (USA)

NOAA CONTINUOUS VHF WEATHER BROADCASTS

Diagram page 210

For complete details of the NOAA's operations and services, please see the note under the United States of America Geographic Area, specifically under subheading **NOAA WEATHER RADIO (NWR)**.

MULTILINGUAL LIST OF TERMS USED IN WEATHER AND SEA BULLETINS

The following is taken from the WMO publication Manual on Marine Meteorological Services — WMO–No. 558

ENGLISH	FRANÇAIS	ESPAÑOL
Standards of time	**Unités de temps**	**Unidades de tiempo**
Universal Coordinated Time (UTC)	Temps universel coordonné (UTC)	Tiempo universal coordinado (UTC)
Zone time	Heure du fuseau	Hora zona
Summer time	Heure d'été	Hora de verano
Local time	Heure locale	Hora local
Periods of time	**Périodes de temps**	**Períodos de tiempo**
Six hours	Six heures	Seis horas
Twelve hours	Douze heures	Doce horas
Eighteen hours	Dix-huit heures	Dieciocho horas
Twenty-four hours	Vingt-quatre heures	Veinticuatro horas
Thirty-six hours	Trente-six heures	Treinta y seis horas
Forty-eight hours	Quarante-huit heures	Cuarenta y ocho horas
Today	Aujourd'hui	Hoy
Tomorrow	Demain	Mañana
Next few days	Les prochains jours	Los próximos días
Morning	Matin	Mañana
Evening	Soir	Tarde, noche
Midday	Midi	Mediodía
Afternoon	Après-midi	Tarde, noche
Day	Jour	Día
Night	Nuit	Noche
Sunrise	Lever du soleil	Orto
Sunset	Coucher du soleil	Ocaso
Preliminary terms	**Termes préliminaires**	**Términos preliminares**
Forecast	Prévision	Previsión, pronóstico
Further outlook	Evolution ultérieure probable	Evolución probable
General inference	Situation générale et évolution	Perspectivas futuras
General statement	Situation générale	Situación general
Long-range forecast	Prévision à longue échéance	Previsión a largo plazo
Medium-range forecast	Prévision à moyenne échéance	Previsión a medio plazo
Short-range forecast	Prévision à courte échéance	Previsión a corto plazo
Synoptic situation	Situation synoptique	Situación sinóptica
Warning	Avis	Aviso
Terms of position	**Termes de position**	**Términos de posición**
Degrees	Degrés	Grados
Latitude	Latitude	Latitud
Longitude	Longitude	Longitud
Quadrant	Quadrant	Cuadrante
Hemisphere	Hémisphère	Hemisferio
North	Nord	Norte
South	Sud	Sur
East	Est	Este
West	Ouest	Oeste
District	District	Distrito
Parallel	Parallèle	Paralelo
Meridian	Méridien	Meridiano
Square	Carré	Cuadrado
Bearing	Relèvement	Rumbo
Direction	Direction	Dirección
Track	Trajetectoire, route	Trayectoria
Area	Zone	Área, zona
Line	Ligne	Línea
Storm warnings	**Avis de tempête**	**Avisos de temporales**
Gale warning	Avis de coup de vent	Aviso de viento duro

Storm warnings	**Avis de tempête**	**Avisos de temporales**
Storm warning	Avis de tempête	Aviso de temporal
Hurricane warning	Avis d'ouragan	Aviso de huracán
Blizzard	Blizzard	Blizzard, ventisca
Tropical storms	**Cyclones tropicaux**	**Ciclones tropicales**
Tropical cyclone	Cyclone tropical	Ciclón tropical
Hurricane	Ouragan	Huracán
Tornado	Tornade	Tornado
Typhoon	Typhon	Tifón
Baguio	Baguio	Baguio
Willy-willy	Willy-willy	Willy-willy
Pressure systems	**Systèmes de pression**	**Sistemas de presión**
Area of low pressure	Zone de basses pressions	Área de bajas presiones
Low	Dépression	Depresión barométrica
Trough	Creux barométrique	Vaguada
Area of high pressure	Zone de hautes pressions	Área de altas presiones
High	Anticyclone	Anticiclón
Ridge of high pressure	Dorsale, crête barométrique	Cresta de alta presión
Belt of high pressure	Ceinture de hautes pressions	Cinturón de altas presiones
Belt of low pressure	Ceinture de basses pressions	Cinturón de bajas presiones
Col	Col barométrique	Collado
Hyperbolic point	Point hyperbolique	Punto hiperbólico
Cyclolysis	Cyclolyse	Ciclolisis
Cyclogenesis	Cyclogénèse	Ciclogénesis
Anticyclolysis	Anticyclolyse	Anticicloisis
Anticyclogenesis	Anticyclogénèse	Anticiclogénesis
Air mass nomenclature	**Nomenclature des masses d'air**	**Nomenclatura de las masas de aire**
Air mass	Masse d'air	Masa de aire
Stable air mass	Masse d'air stable	Masa de aire estable
Unstable air mass	Masse d'air instable	Masa de aire inestable
Cold air	Air froid	Aire frío
Arctic air	Air arctique	Aire ártico
Antarctic air	Air antarctique	Aire antártico
Polar air	Air polaire	Aire polar
Warm air	Air chaud	Aire caliente, aire cálido
Tropical air	Air tropical	Aire tropical
Subtropical air	Air subtropical	Aire subtropical
Equatorial air	Air équatorial	Aire ecuatorial
Maritime air	Air maritime	Aire marítimo
Continental air	Air continental	Aire continental
Winter monsoon	Mousson d'hiver	Monzón de invierno
Summer monsoon	Mousson d'été	Monzón de verano
Front nomenclature	**Nomenclature des fronts**	**Nomenclatura de los frentes**
Front	Front	Frente
Polar front	Front polaire	Frente polar
Cold front	Front froid	Frente frío
Secondary cold front	Front froid secondaire	Frente frío secundario
Warm front	Front chaud	Frente caliente
Occlusion	Occlusion	Oclusión
Cold occlusion	Occlusion à caractère de front froid	Oclusión fría
Warm occlusion	Occlusion à caractère de front chaud	Oclusión caliente
Upper front	Front en altitude	Frente en altura
Intertropical front	Front intertropical	Frente intertropical
Frontal wave	Onde frontale	Onda frontal
Frontogenesis	Frontogénèse	Frontogénesis
Frontolysis	Frontolyse	Frontolisis
Weather	**Temps**	**Tiempo**
Precipitation	*Précipitation*	*Precipitación*
Rain	Pluie	Lluvia

Weather	**Temps**	**Tiempo**
Freezing rain	Pluie se congelant	Lluvia engelante
Rain and snow	Pluie et neige mêlées	Lluvia y nieve mezcladas
Supercooled rain	Pluie surfondue	Lluvia subfundida
Snow	Neige	Nieve
Snow pellets	Neige roulée	Nieve granulada
Snow grains	Neige en grains	Cinarra, gragea
Drizzle	Bruine	Llovizna
Hail	Grêle	Granizo
Diamond dust	Poudrin de glace	Polvillo de hielo
Ice pellets	Granules de glace	Gránulos de hielo
Small hail	Grésil	Granizo menudo
Shower	Averse	Chubasco
Visibility	*Visibilité*	*Visibilidad*
Fog	Brouillard	Niebla
Mist	Brume	Neblina
Haze	Brume sèche	Calima
Duststorm	Tempête de poussière	Tempestad de polvo
Sandstorm	Tempête de sable	Tempestad de arena
Spray	Embruns	Rociones
Drifting snow	Chasse-neige basse	Ventisca baja
Blowing snow	Chasse-neige élevée	Ventisca alta
Miscellaneous	*Divers*	*Misceláneos*
Cloud	Nuage	Nube
Clearing up	Se dissipant	Despejándo(se)
Line squall	Grain en ligne	Turbonada en línea
Whirlwind	Tourbillon de vent	Remolino de viento
Water-spout	Trombe marine	Tromba marina
Frost, freezing	Gelée, gel	Helada
Rime	Givre blanc	Cencellada blanca
Glaze	Givre transparent	Cencellada transparente
Smoke	Fumée	Humo
Thunderstorm	Orage	Tormento
Thunder	Tonnerre	Trueno
Lightning	Eclair	Relámpago

Wind	**Vent**	**Viento**
General Terms	*Termes généraux*	*Términos generales*
Beaufort scale	Échelle de Beaufort	Escala Beaufort
Calm	Calme	Calma
Light air	Très légère brise	Ventolina
Light breeze	Légère brise	Flojito (viento), brisa muy débil
Gentle breeze	Petite brise	Flojo (viento), brisa débil
Moderate breeze	Jolie brise	Bonancible (viento), brisa moderada
Fresh breeze	Bonne brise	Fresquito (viento), brisa fresca
Strong breeze	Vent frais	Fresco (viento), brisa fuerte
Near gale	Grand frais	Frescachón, viento fuerte
Gale	Coup de vent	Viento duro
Strong gale	Fort coup de vent	Viento muy duro
Storm	Tempête	Tormenta, tempestad, temporal
Violent storm	Violente tempête	Temporal duro, borrasca
Hurricane	Ouragan	Huracán
Gust	Rafale	Ráfaga, racha
Squall	Grain	Turbonada
Sea breeze	Brise de mer	Brisa de mar
Land breeze	Brise de terre	Brisa de tierra
Prevailing wind	Vent dominant	Viento dominante
Shift of wind	Saute de vent	Salto de viento
Veering (clockwise change in direction)	Rotation du vent (dans le sens des aiguilles d'une montre)	Cambio de dirección (en el sentido de las agujas del reloj)
Backing (anti-clockwise change in direction)	Rotation du vent (dans le sens contraire des aiguilles d'une montre)	Cambio de dirección (en el sentido contrario de las agujas del reloj)
Local Names	*Noms locaux*	*Nombres locales*
Trade winds (trades)	Alizés	Vientos alisios (alisios)

Wind	**Vent**	**Viento**
Bora	Bora	Bora
Mistral	Mistral	Mistral
Sirocco	Sirocco	Siroco
Gregale	Grégal	Gregal
Levanter	Levante	Levante
Norther	Norther	Nortada
Ice	**Glace**	**Hielo**
Bergy bit	Fragment d'iceberg	Tempanito
Brash ice concentration	Concentration en brash (sarrasins)	Concentración de escombro de hielo
Fast ice	Banquise côtière	Hielo fijo
First year ice	Glace de première année	Hielo del primer año
Flaw	Brèche de séparation	Grieta
Floe	Floe	Bandejón
Frazil	Frasil	Cristales de hielo
Grease ice	Sorbet	Hielo grasoso
Grey ice	Glace grise	Hielo gris
Grey-white ice	Glace blanchâtre	Hielo gris blanco
Growler	Bourguignon	Gruñón
Hummocked ice	Glace hummockée	Hielo amonticulado
Iceberg	Iceberg	Témpano
Ice boundary	Ligne de démarcation de glaces	Frontera del hielo
Ice edge	Lisière de glace	Borde del hielo
Ice field	Champ de glace	Campo hielo
Ice limit	Limit des glaces	Limite del hielo
Ice patch	Banc de glace	Manchón de hielo
Ice rind	Glace vitrée	Costra de hielo
Ice shelf	Plateau de glace	Meseta de hielo
Level ice	Glace plane	Hielo plano
New ice	Nouvelle glace	Hielo nuevo
Nilas	Nilas	Nilas
Pack ice	Banquise	Hielo a la deriva
Pancake ice	Glace en crêpes	Hielo panqueque
Polynya	Polynie	Polinia
Rafted ice	Glace entassée ou empilée	Hielo sobreescurrido
Shore lead	Chenal côtier	Canal costero
Shuga	Shuga	Shuga
Slush	Gadoue	Pasta o grumo
Young Ice	Jeune glace	Hielo joven
Miscellaneous nautical terms	**Termes nautiques divers**	**Términos náuticos diversos**
Sea	Mer	Mar
Sea level	Niveau de la mer	Nivel del mar
Horizon	Horizon	Horizonte
Tsunami	Tsunami	Tsunami
Swell	Houle	Mar de fondo
Tide	Marée	Marea
Surge	Lame de fond	Oleada
Surf	Déferlement	Resaca
Breakers	Brisants	Rompientes
Wave	Vague	Ola
Wavelet	Vaguelette	Ola pequeña
General descriptive terms	**Termes descriptifs généraux**	**Términos descriptivos generales**
Slight	Faible (léger)	Leve
Moderate	Modéré	Moderado
Violent	Violent	Violento
Heavy	Fort (gros)	Fuerte
Strong	Fort	Fuerte
Dry	Sec	Seco
Damp	Humide	Húmedo
In patches	Par plaques, en bancs	En bancos
Extensive	Etendu	Extenso

General descriptive terms	Termes descriptifs généraux	Términos descriptivos generales
Low	Bas	Baja
High	Haut, élevé	Alta
Rough	Forte	Duro
Recurve	Se recourber	Recurvarse
Quickly	Rapidement	Rápidamente
Slowly	Lentement	Lentamente
Filling up	Se comblant	Llenándose
Increasing	Croissant, augmentant	Aumentando
Decreasing	Décroissant, diminuant	Disminuyendo
Breaking up	Se dissolvant	Disipándose
Poor	Mauvais	Malo
Good	Bon	Bueno
Spreading	S'étendant	Extendiendose
Occasional	Occasionnel	Ocasional
Continuous	Continu	Continuo
Intermittent	Intermittent	Intermitente
At times	De temps à autre	A veces
Immediately	Immédiatement	Immediatamente
Early	Tôt	Temprano
Late	Tard	Tarde
Later	Plus tard, par la suite	Luego, más tarde

Diagrams pages 292 and 293

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V3(2)PMO1 V010 24/04/17
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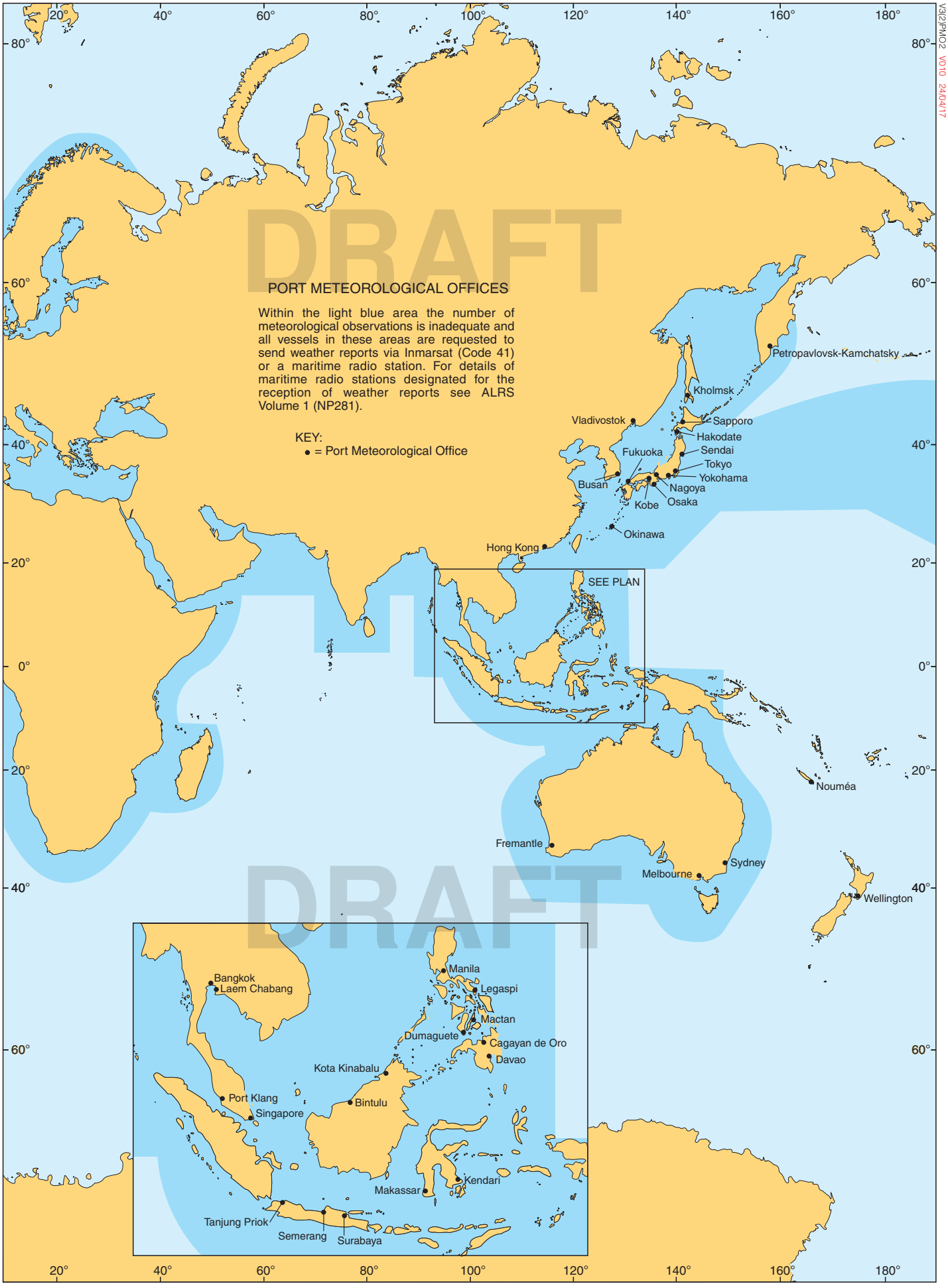
160°
140°
120°
100°
80°
60°
40°
20°
0°
80°
60°
40°
20°
0°
20°
40°
60°
Anchorage
Kodiak
Edmonton
Vancouver
Seattle
Winnipeg
Duluth
Montréal
Halifax
Hamilton
New York
Baltimore
Norfolk
Oakland
Long Beach
New Orleans
Charleston
Jacksonville
Houston
Fort Lauderdale
Honolulu
Guadeloupe
Guayaquil
Talara
Paita
Salaverry
Chimbote
Callao
Pisco
San Juan
Mollendo
Iquique
Niterói
Papeete
Valparaiso
Talcahuano
Buenos Aires
Puerto Montt
Port Stanley
Punta Arenas


V3/2/PMO2 V010 24/04/17
DRAFT
PORT METEOROLOGICAL OFFICES
Within the light blue area the number of meteorological observations is inadequate and all vessels in these areas are requested to send weather reports via Inmarsat (Code 41) or a maritime radio station. For details of maritime radio stations designated for the reception of weather reports see ALRS Volume 1 (NP281).
KEY:
• = Port Meteorological Office
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20° 40° 60° 80° 100° 120° 140° 160° 180°
80° 60° 40° 20° 0° 20° 40° 60°
Petropavlovsk-Kamchatsky
Kholmsk
Vladivostok
Sapporo
Hakodate
Fukuoka
Sendai
Tokyo
Yokohama
Busan
Nagoya
Kobe
Osaka
Okinawa
Hong Kong
SEE PLAN
Nouméa
Fremantle
Sydney
Melbourne
Wellington
Bangkok
Laem Chabang
Manila
Legaspi
Mactan
Dumaguete
Cagayan de Oro
Davao
Kota Kinabalu
Port Klang
Singapore
Bintulu
Kendari
Makassar
Tanjung Priok
Semerang
Surabaya

THE WMO VOLUNTARY OBSERVING SHIP PROGRAMME (VOS)

INTRODUCTION

Lieutenant Matthew Fontaine Maury of the U.S. Navy was the first man to realise the scientific and commercial value of weather information collected from ships. Owing to his initiative, the first International Meteorological Conference was held in Brussels in 1853 to consider international cooperation and a uniform system of observation.

With the advent of radio communications early in the twentieth century, it became possible for observations from ships to be transmitted to meteorological offices ashore and warnings of dangerous conditions to be transmitted to ships.

At the 1929 meeting of the International Convention for the Safety of Life at Sea (SOLAS), provision was made for the international encouragement of meteorological work at sea.

Meteorological services of most maritime countries made arrangements with ships regularly visiting their coast, to take marine meteorological observations and transmit them to shore at no cost to the ship. The observations themselves are usually provided free of charge by shipping companies, in return for the instrumentation and the forecasting and warning service, hence the name of the scheme - Voluntary Observing Ship (**VOS**). In addition, Port Meteorological Officers (**PMOs**) provide free training in observing the weather, whilst essential meteorological supplies are provided by participating National Meteorological Services (**NMSs**). A list of PMOs is maintained by WMO at:

http://www.jcomm.info/index.php?option=com_oe&task=viewGroupRecord&groupID=151 and is also listed in ALRS Volume 3 in the Ships' Weather Reports section.

Ships are recruited by Members of the WMO, usually through Port Meteorological Officers **(PMOs**), who recruit into their **VOS** fleets ships of all flags, not just those on their national register. Ships are recruited on the basis of the willingness of the ships' officers to perform the observations and the regular route followed by the ship. A Member will generally recruit ships which regularly visit ports in the country concerned and which are on the national register of that nation, however foreign registered ships may also be recruited, in which case the meteorological service of the country of registry is informed.

Maritime meteorological data is required for a number of purposes:

- Preparation of marine forecasts and warnings
- Preparation of forecasts and warnings for offshore industries;
- Marine consultancy
- Global computer models of the future state of the atmosphere
- To monitor the state of the oceans using delayed-mode data in weekly and monthly analyses
- Climatological data banks used for many purposes, e.g. design of ships and structures at sea and determination of economic shipping routes etc.
- Compilation of long-term records to monitor changes in the climate of the earth.

The VOS Scheme makes a highly important contribution to the Global Observing System (GOS) of the World Weather Watch (WWW) and increasingly to global climate studies. The oceans cover about two-thirds of the surface of the earth and for decades ships were the only means of obtaining meteorological data from them. Although there are now several other means - satellites, drifting buoys, floats and radar - ships still play a very important part. They provide ground truth for the calibration of satellite observations and make measurements not yet obtainable by other means, such as air temperature and dew point.

Since 1999, the marine activities of WMO, as well as those of the Intergovernmental Oceanographic Commission (IOC) of UNESCO, have been coordinated by the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM).

OBSERVATIONS

Ships' observations are generally made at the standard synoptic hours of 0000, 0600, 1200 and 1800 UTC and are sent to a meteorological service by INMARSAT-C or email communication. In the case of INMARSAT C, the cost of transmission is paid by the meteorological service of the receiving country. Observations at the intermediate reporting times of 0300, 0900, 1500 and 2100 UTC are also welcomed and observers are urged to report at any UTC hour if they missed the standard or intermediate reporting times, or if weather conditions varied markedly from that forecast.

A list of all **VOS** and their instrumentation is maintained in WMO publication No. 47
http://www.wmo.int/pages/prog/www/ois/pub47/pub47-home.htm on the basis of information supplied by Members. Metadata about the type of instrumentation, location and exposure are absolutely essential to a correct interpretation and use of the observations.

Relevant standard and recommended practices and procedures are contained in Part III, Section 2.2.3 of the Manual on the Global Observing System (WMO-No.544) as well as in Chapter 6 of the (provisional) Guide to MMS (WMO-471).

CLASSIFICATIONS OF VOS SHIP

There are eight classes of ships in the international **VOS** Scheme, which are listed below. It should be noted that it is increasingly the case that many nations are providing Automatic Weather Stations (**AWSs**) to their fleets:

A **Selected** ship is equipped with sufficient certified meteorological instruments for making observations, transmits regular weather reports and enters the observations in meteorological logbooks. It should have at least a barometer, a thermometer for sea-surface temperature, a psychrometer and a barograph. Most of the **VOS** are selected ships.

A **Selected AWS** ship is a mobile ship station equipped with an Automatic Weather Station (AWS) system comprising certified meteorological instruments to measure at least: air pressure, pressure change, temperature and humidity. Optional sensors would

include wind speed and direction and sea temperature measurement. The AWS may or may not have the facility for manual input of the visual elements, and transmit reports at least three hourly or more frequently. The AWS should have the facility to log the data.

A **VOSClim** ship is a mobile ship station equipped with sufficient certified meteorological instruments for making observations. It transmits regular and timely weather reports, enters the observations in an International Maritime Meteorological Tape (IMMT) compliant electronic logbook (including the extra **VOSClim** delayed-mode groups) and has a proven record of providing high quality observations. A **VOSClim** ship should have at least: a barometer, a thermometer to measure SST, a psychrometer (for air temperature and humidity), a barograph and possibly an anemometer. The full range of metadata must be maintained in WMO No. 47, the full suite of digital images, sketches and drawings must be available, and the delayed-mode IMMT data must be submitted to the Global Collecting Centres (**GCCs**) according to recommended WMO procedures. It is highly desirable for a **VOSClim** ship to be inspected at less than six monthly intervals.

A **VOSClim AWS** ship is a mobile ship station equipped with an AWS system comprising certified meteorological instruments to measure at least: air pressure, pressure change, temperature and humidity. Optional sensors would include wind speed and direction and sea temperature measurement. The AWS may have a facility for manual input of the visual elements, and transmit reports at least three hourly or more frequently. The AWS must have the facility to log the data including the additional IMMT delayed-mode **VOSClim** groups. The full range of metadata must be maintained in WMO No. 47, the full suite of digital images, sketches and drawings must be available, and the delayed-mode IMMT data must be submitted to the GCCs according to the recommended WMO procedures. It is highly desirable for a **VOSClim** AWS ship to be inspected at less than six monthly intervals.

A **Supplementary** ship is a mobile ship station equipped with a limited number of certified meteorological instruments for making observations. It transmits regular weather reports and enters the observations in a meteorological logbook.

A **Supplementary AWS** ship is a mobile ship station equipped with an AWS system comprising a limited number of certified meteorological instruments and reporting regularly. The AWS should at least measure air pressure.

An **Auxiliary** ship is a mobile ship station normally without certified meteorological instruments, which transmits in a reduced code form or in plain language, either on a routine basis or on request, in certain data sparse areas and under certain conditions.

An **Auxiliary AWS** ship is a mobile ship station equipped with an AWS system comprising non-certified meteorological instruments and reporting regularly. The AWS should at least measure air pressure.

Figure 1: Required observations for each class of ship in the VOS.

element	Selected	VOSClim	Supplementary	Auxiliary
present and past weather	N	N	N	N
wind direction and speed	N	N	N	N
cloud amount	N	N	N	N
cloud type and height of base	N	N	N	X
visibility	N	N	N	N
temperature	O	O	N	N
humidity (dew point)	O	O	X	X
atmospheric pressure	O	O	O	N
pressure tendency	O	O	X	X
ship's course and speed	O	O	X	X
sea surface temperature	N	N	X	X
direction, period and height of waves	N	N	X	X
sea ice and/or icing	N	N	N	N
special phenomena	N	N	X	X
max height of deck cargo from SLL	X	O	X	X
height difference from the SLL to the water line	X	O	X	X
course of ship over ground	X	O	X	X
ship's ground speed	X	O	X	X
ship's heading	X	O	X	X

O reported by non-AWS and AWS ships.

N reported by non-AWS ships only.

X non-reported.

MAKING OBSERVATIONS EASIER AND MORE ACCURATE

Software, such as TurboWin (freeware) http://www.knmi.nl/turbowin/, is available to assist the mariner in the recording, preparation and transmission of meteorological records. TurboWin was developed at KNMI (Royal Netherlands Meteorological Institute) with contributions from several National Meteorological Services and endorsed by the WMO (World Meteorological Organization) and E-SURFMAR (European Surface Marine Programme).

It is recognised that observations are subject to keying, coding and calculating errors, etc., so to help achieve an optimal control of the quality of the observations, before they are used in real time TurboWin contains checking routines which are applied to the data before they are transmitted. TurboWin is a user-friendly system with over 200 built-in quality checks. It allows the automated compilation of observations on board ships and fixed sea stations, their downloading to disk and their subsequent transmission ashore and thence to a Meteorological Centre, by using Inmarsat, E-mail or other specific communication facilities. The program assists the observer with many menus, pictures, photos, forms, help pages, output options, automated calculations etc.

Observers can also monitor the quality of their observations via the web using tools such as those developed by the UK Met Office and within the Eumetnet E-SURFMAR programme.
http://research.metoffice.gov.uk/research/nwp/observations/monitoring/marine/index.html and http://www.meteo.shom.fr/qctools/

FURTHER INFORMATION

Further information on the VOS scheme, National VOS websites and the areas covered here can be obtained from the following:

- Oceans Affairs Division, World Meteorological Organization, 7 bis, avenue de la Paix, P.O. Box 2300, CH-1211 Geneva 2, SWITZERLAND, Tel: + 41 22 730 82 37 Fax: +41 22 730 80 21
  Internet:http://www.wmo.ch
- http://www.bom.gov.au/jcomm/vos/
- http://www.dwd.de/gcc
- http://www.hko.gov.hk/wservice/tsheet/pms/index_e.htm
- http://www.imdpune.gov.in/weather_forecasting/Marine/index.htm
- http://www.jcomm.info
- http://www.jcommops.org/sot/
- http://www.knmi.nl/turbowin/
- http://www.knmi.nl/vos/
- http://www.meteo.shom.fr/qctools/
- http://www.metoffice.gov.uk/weather/marine/observations/gathering_data
- http://research.metoffice.gov.uk/research/nwp/observations/monitoring/marine/index.htm
- http://www.wmo.int/pages/prog/amp/mmop/JCOMM/OPA/SOT/vos.html
- http://www.vos.noaa.gov/

Acknowledgement is made to the above sources, particularly to JCOMM, the UK Met Office and the Australian Bureau of Meteorology, for their assistance in compiling this overview of the VOS.

INMARSAT C LAND EARTH STATIONS (LES) ACCEPTING CODE 41 MESSAGES

Atlantic Ocean Region - East (AOR-E)

LES Operator	LES Name	Access Codes	Country
Vizada	Eik	101	Norway
Stratos Global	Burum	102	Netherlands
KDDI	Yamaguchi at Aussaguel	103	France
Vizada	Eik	104	Norway
Telecom Italia	Fucino	105	Italy
Stratos Global	Burum	112	Netherlands
Morsviazsputnik	Nudol	117	Russian Federation
Vizada	Aussaguel	121	France

Atlantic Ocean Region - West (AOR-W)

LES Operator	LES Name	Access Codes	Country
Vizada	Eik	001	Norway
Stratos Global	Burum	002	Netherlands
KDDI	Yamaguchi at Aussaguel	003	France
Vizada	Eik	004	Norway
Stratos	Burum	012	Netherlands
Vizada	Aussaguel	021	France

Continued on next page

Indian Ocean Region (IOR)

LES Operator	LES Name	Access Codes	Country
Vizada	Eik	301	Norway
Stratos Global	Perth	302	Australia
KDDI	Yamaguchi	303	Japan
Vizada	Eik	304	Norway
VSNL	Pune[2]	306	India
MCN	Beijing	311	China
Stratos Global	Perth	312	Australia
Morsviazsputnik	Nudol	317	Russian Federation
Vizada	Aussaguel	321	France
Singapore Telecom	Sentosa	328	Singapore
Vishipel	Haiphong	330	Vietnam
Telecom Italia	Fucino	335	Italy

Pacific Ocean Region (POR)

LES Operator	LES Name	Access Codes	Country
Vizada	Eik at Santa Paula	201	USA
Stratos Global	Perth	202	Australia
KDDI	Yamaguchi	203	Japan
Vizada	Eik at Santa Paula	204	USA
Singapore Telecom	Sentosa	210	Singapore
MCN	Beijing	211	China
Stratos Global	Perth	212	Australia
Morsviazsputnik	Nakhodka	217	Russian Federation
Vizada	Aussaguel at Yamaguchi	221	Japan

NOTES:
(1) Code 41 should be used by weather observing vessels to send their weather observations. In most cases where the service is available, the service is free of charge to vessels, the national weather authority paying the relevant charges.
(2) For full details of Inmarsat services see ALRS Volume 1 (NP281) and Volume 5 (NP285).

For full details of Meteorological Codes see ALRS Volume 3(1) (NP283(1))

MARITIME FORECAST CODE (MAFOR)

MAFOR

YYG_1G_1/	**$0AAAa_m$ $1GDF_mW_m$**
YYG_1G_1/	YY: Day of the month G_1G_1: Time of commencement of forecast (UTC). Midnight is encoded as 00
$0AAAa_m$	The maritime area to which the whole forecast or set of forecasts refers. If the geographical name for the forecast is used instead of the indicator $0AAAa_m$, it shall be inserted at the place of this group.
$1GDF_mW_m$	G: Forecast period D: Direction from which the wind is blowing F_m: Beaufort number W_m: Forecast weather

a_m	**Portion of the maritime area**
Code	
0	Whole of the area AAA
1	NE quadrant of the area AAA
2	Eastern half of the area AAA
3	SE quadrant of the area AAA
4	Southern half of the area AAA
5	SW quadrant of the area AAA
6	Western half of the area AAA
7	NW quadrant of the area AAA
8	Northern half of the area AAA
9	Rest of the area AAA

G	**Forecast period**
Code	
0	Beginning of period
1	Valid for 3 hours
2	Valid for 6 hours
3	Valid for 9 hours
4	Valid for 12 hours
5	Valid for 18 hours
6	Valid for 24 hours
7	Valid for 48 hours
8	Valid for 72 hours
9	Occasionally

D **Direction from which the wind is blowing**

Code	
0	Calm
1	NE
2	E
3	SE
4	S
5	SW
6	W
7	NW
8	N
9	Variable

F_m **Wind strength, Beaufort number**

Code	Beaufort number	Code	Beaufort number
0	0–3	5	8
1	4	6	9
2	5	7	10
3	6	8	11
4	7	9	12

W_m **Forecast weather**

Code	
0	Visibility greater than 3 nm
1	Risk of accumulation of ice on superstructures
2	Strong risk of accumulation of ice on superstructure
3	Visibility >=1 nm and <=3 nm
4	Visibility <=1 nm, including fog
5	Drizzle
6	Rain
7	Snow, or rain and snow
8	Squally weather with or without showers
9	Thunderstorms

ICE REPORTS

There are four organisations that provide Ice Reporting and support services in the Arctic Region covered by NP283(2): The International Ice Patrol (IIP), Canadian Ice Service (CIS), Greenland Ice Service and the Russian Northern Sea Route Administration. The methods by which ice information is distributed vary and are detailed in the individual entries. Mariners are encouraged to submit meteorological observations to the organisations using the methods stated, in order to increase the accuracy of synopsis and forecasts for all.

INTERNATIONAL ICE PATROL

In February of each year, the International Ice Patrol (IIP) commences its annual service of providing maritime safety information on ice conditions near the Grand Banks of Newfoundland. The IIP and the Canadian Ice Service (CIS) issue one daily iceberg analysis under the North American Ice Service (NAIS), a collaborative agreement to unify North American ice information and improve service to mariners. The Iceberg Limit determined by IIP will be published in daily message bulletins and graphical charts and distributed as indicated in Table 1. CIS will continue their traditional distribution mechanisms. IIP will produce the NAIS daily iceberg warnings from February to August. CIS will generate NAIS iceberg products for the remainder of the year.

The purpose of NAIS iceberg bulletins and charts is to advise mariners of the estimated iceberg extent within the region. Numbers within each grid sector inside the Iceberg Limit are intended to provide mariners with an awareness of the relative density of icebergs. Navigating among icebergs inside the limit based solely on the NAIS iceberg products is strongly discouraged.

While the NAIS strives to be as accurate as possible in reporting the presence of icebergs to mariners, it is not possible to ensure that all icebergs are detected and reported. Mariners are urged not to rely entirely upon radar to locate icebergs, since they are often not detected by radar alone. There is no substitute for due vigilance and prudent seamanship, especially when operating near sea ice and icebergs.

Reports of ice in this area originate from various sources, including passing vessels and reconnaissance flights. When position, time, size and description of iceberg sightings are received, the data is entered into a computer programme that predicts iceberg drift and deterioration. As the time after sighting increases, so does the probability of error in estimated positions. This probability of error is taken into account when the Iceberg Limit is determined.

Between 1 February and 31 August, vessels are encouraged to immediately report sightings of icebergs or stationary radar targets (RT) that may likely be ice to IIP. Through the remainder of the year, ice reports should be directed to Canadian Coast Guard Radio Station. Vessels operating near the iceberg or sea ice limits are encouraged to make sea surface temperature (SST) and weather (Wx) reports even if no ice is detected. Vessels that provide routine Wx reports to METEO Washington are urged to continue to do so. If SST and Wx reports are not typically filed as described above, then special reports directly to IIP every 6 hours are requested when operating within the area between latitudes 40°N and 60°N and between longitudes 39°W to 57°W.

When reporting icebergs or stationary RT, please include the following information:

- **Vessel name and call sign**
- **Vessel position** (lat/long)
- **Course, speed and visibility**
- **Iceberg / RT position** (specify either the geographic coordinates (lat/long) or range/bearing from vessel's stated geographic position (lat/long))
- **Time of sighting** (UTC)
- **Method of detection** (visual, radar or both)
- **Size and shape of iceberg** (see Tables 2 and 3)
- **Sea ice concentration** (in tenths)
- **Sea ice thickness in feet or metres** (specify units)
- **Sea surface temperature** (specify units)

When reporting sea surface temperature and weather, please include the following information:

- **Vessel name and call sign**
- **Time** (UTC)
- **Vessel position** (lat/long)
- **Course**
- **Speed**
- **Visibility**
- **Air and sea surface temperature** (specify units)
- **Barometric pressure**
- **Wind direction and speed**

Report ice sightings, Wx and SST to COMINTICEPAT NEW LONDON CT through INMARSAT, US Coast Guard Communication Stations or Canadian Coast Guard Marine Communications and Traffic Services. If reporting ice sightings to IIP through INMARSAT C, use Service Code 42 as there is no charge when using this code.

Instructions for sending INMARSAT Code 42 Warnings:
INMARSAT C (General instructions)

1 Access the 2-digit code service on SES as instructed in your manufacturer's information.
2 Using the SES text editor, prepare the message.
3 Enter the 2-digit code of the service required (42).
4 Select the CES (01, Vizada, AOR-W).
5 Transmit the message.
6 Wait for the acknowledgement from the CES.
7 The message will be forwarded, at no charge, from the mariner to IIP by Vizada Satellite Services.

Telephone communications are available to the IIP office throughout the year.

International Ice Patrol Office in New London, CT

Tel:	+1 860 2712626 (IIP Duty Officer 1200–0000 UTC)
Toll free:	+1 877 4237287
Fax:	+1 860 2712773 (IIP Duty Officer 1200–0000 UTC)
e-mail:	iipcomms@uscg.mil
Website:	www.navcen.uscg.gov/iip

Canadian Ice Service in Ottawa, ON

Tel:	+1 819-938-3860
Toll free:	+1-800-668-6767 (in Canada only)
Fax:	–
e- mail:	ec.enviroinfo.ec@canada
Website:	www.ice-glaces.ec.gc.ca

U.S National Ice Center/Naval Ice Center

Tel:	+1 301 8173975 (Command)
Website:	www.natice.noaa.gov/index.html

Continued Overleaf

TABLE 1: NAIS BROADCASTS BY IIP

(See the appropriate station entry for full broadcast details)

Product Type	Transmission	Stations	Broadcast Times (UTC)	Frequencies
NAIS ICEBERG NAVTEX[1]	NAVTEX	Boston (USCG) (NMF)	005 0450 0850 1250 1650 2050 (Feb–July approx.)	518 kHz
		Robin Hood Bay	1820 (winter) 2220 (summer)	
NAIS ICEBERG BULLETIN	RADIO-TELEX / SITOR	COMMCOMM via Boston (USCG) (NMF)	0140 1630	6314 8416·5 12579 16806·5 kHz
	Radio Telephone	Labrador (Goose Bay) (Canadian CG)	0107 0137 0907 1007 1437 1907 2037	2598 kHz
			Continuous broadcast	VHF Ch 21B 83B
	Radio Telephone	Placentia (Canadian CG)	0007 0737 0837 1637 2007 2137 & as required	2598 kHz
			Continuous broadcast	VHF Ch 21B 28B 83B
	Inmarsat SafetyNET Broadcasts	AOR–W	2200	Inmarsat C SafetyNET
			Urgent broadcasts of targets outside limit sent upon receipt	
	Internet	International Ice Patrol	Updated daily by 2200	www.navcen.uscg.gov/iip
		National Geospatial Intelligence Agency		https://msi.nga.mil/NGAPortal/MSI.portal
NAIS ICEBERG CHART	RADIO-FACSIMILE	COMMCOMM via Boston (USCG) (NMF)	0438 1039 1600 2239	4235 6340·5 9110 12750 kHz
		Pinneberg (Germany)	See ALRS Volume 3(1) NP283(1) for 'Summer' and 'Winter' schedules	3855 7880 13882·5 kHz
		Sydney (VCO) (Canadian CG)	2200 2331 1121 1142 1741	4416 kHz 6915·1 kHz
	Internet	International Ice Patrol	Updated daily by 2200	www.navcen.uscg.gov/iip
		National Weather Service		http://tgftp.nws.noaa.gov/fax/PIEA88.gif
		e-mail on demand[2]		nws.ftpmail.ops@noaa.gov

1	Mariners should note that NAIS ICEBERG NAVTEX (Category 3) may be programmed for rejection at the receiver. Mariners desiring to receive these NAVTEX reports must ensure that their receivers are appropriately programmed for reception.
2	To prompt e-mail on demand send an e-mail to nws.ftpmail.ops@noaa.gov with any subject line. The body of the text should read as follows (please note the text is case sensitive and must be sent in plain text format): *open* *cd fax* *get PIEA88.gif - - - or- - - get PIEA88.TIF* *quit* The e-mail server will then automatically send a GIF or TIF formatted image of the facsimile back to the senders e-mail.

TABLE 2: SIZE DESCRIPTIONS USED BY NAIS

DESCRIPTIVE NAME	HEIGHTS (in metres)	LENGTH (in metres)
Growler	<5	<5
Bergy Bit	1<5	5<15
Small Iceberg	5–15	15–60
Medium Iceberg	16–45	61–120
Large Iceberg	46–75	121–200
Very Large Iceberg	>75	>200

TABLE 3: SHAPE DESCRIPTIONS USED BY NAIS

SHAPE	DESCRIPTION
Tabular	Flat topped iceberg, most show horizontal banding
Non-Tabular	Does not meet any of the characteristics below
Domed	Smooth and rounded on top
Pinnacled	Central spire or pyramid with 1 or more spires
Wedged	Steep vertical side on one end and sloping on the other
Dry-dock	Eroded with a U-shaped slot or channel near or at water level, with twin columns or pinnacles
Blocky	Flat top with vertical sides
Ice Island	Very large ice floe

CANADA

General Information
Mariners should be aware of the existence of the Eastern Canada Vessel Traffic Service System (ECAREG) and the Northern Canada Vessel Traffic Services Zone and Regulations (NORDREG), which apply to certain vessels operating within the respective designated waters. Ice operations support in these areas is provided by the Canadian Coast Guard and ice-breaker assistance, as well as ice information/routing, should be requested through ECAREG/NORDREG as appropriate (see ALRS Vol.6(5) for further details). The latest ice information is also available through any MCTS centre.
The Canadian Coast Guard publication *Ice Navigation in Canadian Waters* contains important information regarding navigation and operation in ice. It is required that every ship of 100 tons gross or more carry and make use of this publication, which is available as a free download from the following weblink: http://www.ccg-gcc.gc.ca/Ice_home/Ice_Publications/Ice-Navigation-in-Canadian-Waters. Note that there is no longer a paper equivalent of this publication.
Other websites providing useful ice information can be found in the Internet Weather Services section for Canada, elsewhere in this publication.

Canadian Ice Service (CIS)
For general enquiries contact:

Environment and Climate Change Canada
Public Inquiries Centre
7th floor, Fontaine Building
200 Sacré-Coeur Boulevard
Gatineau QC K1A 0H3
Telephone: 819-938-3860
Toll Free: +1-800-668-6767 (in Canada only)
Email: ec.enviroinfo.ec@canada.ca
Website: www.ice-glaces.ec.gc.ca (provides access to ice bulletins, synopsis, forecasts, charts and related information, available in English and French)

Ice Forecasts
Ice forecasts are produced where there is marine activity. The intent is to advise users of ice conditions, including warnings, that are in effect or that could develop during the day, the evening and the following day. Forecasts also provide a point by point description of the ice edge.
The iceberg bulletin is produced once a day. The purpose is to convey routine, general information on the iceberg distribution off the Canadian East Coast. The bulletin provides the estimated limit of all known icebergs and a general description of the number of icebergs for each marine area.

Ice Warning Criteria		
Warning Name		**Warning criteria**
1	Ice pressure warning	Reported or forecast strong ice pressure.
2	Rapid closing of coastal leads warning	Rapid closing of coastal leads is expected to occur. Leads are corridors of mainly ice-free water surrounded by pack ice.
3	Special ice warning	When one tenth or more of grey-white ice or older is expected to move into areas when that ice is not normally present, or
		For any unusual or significant ice event that may present a hazard to navigation.

Ice Program
Ice forecasts are issued for daily, monthly and seasonal time scales.

Ice Reports or Observations
Ice reports from vessels or aircraft are normally relayed through MCTS centres for broadcasts. These reports are all assimilated in the daily ice charts produced by CIS.

Ice Beacons
In order to better track the ice drift or to verify ice models, CIS deploys a few ice beacons yearly. While most beacons are only reporting their positions, a few are equipped with barometric pressure sensors.

Weatheradio Canada
Ice forecasts and warnings are not broadcast via Weatheradio, however, mariners planning operations in waters impacted by hazardous ice conditions may obtain details regarding ice conditions by consulting the CIS website at www.ice-glaces.ec.gc.ca/, or by contacting their regional MCTS centre. Detailed ice information may also be obtained through consultation with an Environment Canada meteorologist using the “Weather One-on-One” 1-900 service at 1-900-565-5555. For cell phone users and credit billing call 1-888-292-2222. User fees apply.

Ice areas
Areas for which ice forecasts apply are identical to the marine forecast areas. In addition to these, ice forecasts will cover Lake Michigan and may cover 3 Sea Areas along the East Coast (501 to 503).

Ice charts
Current ice charts are produced daily by the CIS at 1800 UTC and represent the best estimate of ice conditions at the time of issue. The area covered by the chart depends on the time of the season and these charts are normally broadcast at times specified in station details, see table below for broadcast services.
Once a week CIS produces regional ice charts. It should be noted that these charts are synoptic in nature and the ice conditions shown are averages for the area; so they should be used as a planning, rather than a tactical support tool. They are available on the CIS website at www.ice-glaces.ec.gc.ca and through commercial communication lines but are not broadcast through MCTS centres.
The following list describes ice charts produced to support marine activities which are available for broadcast. All available charts can be transmitted or re-transmitted on request. See station entries for broadcast times.

Continued on next page

Ice chart	Broadcast site	Season
Iceberg limit	Sydney	Year round
Gulf of St. Lawrence		Winter
East or Southeast Newfoundland Waters		
Labrador Coast	Iqaluit	Summer
Hudson Strait		
Northern Hudson Bay		
Southern Hudson Bay		
Foxe Basin		
Davis Strait		
Baffin Bay	Iqaluit (Resolute)	
Approaches to Resolute		
Queen Maud	Iqaluit (Resolute) Iqaluit (Iqaluit)	
Amundsen Gulf	Iqaluit (Iqaluit)	
Alaskan Coast		
Eureka	Iqaluit (Resolute)	On request
Parry Channel		
McClure Strait	Iqaluit (Iqaluit)	
Resolute - Byam	Iqaluit (Resolute)	
Bering Strait	Iqaluit (Iqaluit)	
Chukchi		
Nunivak		
Canada Basin		
Alert		
Nome	Iqaluit (Inuvik)	
Arctic Ocean	Iqaluit (Iqaluit)	
North Pole		

NOTE: Ice charts for Canadian Waters available upon request to NORDREG with at least 5 days notice.

Ice-Breakers

The Canadian Coast Guard has a limited number of ice-breakers available for escort and support; these are often heavily committed and are not always be able to provide assistance at short notice. It is therefore important that ECAREG/NORDREG or the MCTS centres are kept informed of vessels positions and future movements via the usual procedures as appropriate. Failure to follow the reporting procedures, by vessels unsure of their ability to cope with the prevailing ice conditions on their own, will only add to the difficulties of providing timely assistance.

To request ice-breaking assistance, please contact the nearest Canadian Coast Guard MCTS centre (see ALRS Vol.1(2) and Vol.6(5)). Further information on Icebreaking operations services can be found on the Canadian Coast Guard webpage www.ccg-gcc.gc.ca/icebreaking/home

Ice-Breaker Communications:

Once a vessel has requested ice-breaker assistance, a radio watch should be kept on 2182 kHz and VHF Ch 16, as ice-breakers have often experienced difficulty when trying to make initial contact with the ship concerned. MF and VHF remain as proven communications tools and should be used to maintain contact with the ice-breakers. A continuous radio watch, on an agreed frequency, is to be maintained on all vessels working with ice-breakers and ships should be capable of using one or more of the following MF/VHF frequencies: *2237 kHz RT (MF)*, *2134 kHz RT (MF)*, *2738 kHz RT (MF)* or *VHF Ch 06 (156.3 MHz)*.

GREENLAND

Greenland Ice Service
DMI Ice Service and Ice Patrol Narsarsuaq collect information regarding ice conditions in the waters around Greenland and distribute this information to vessels primarily as ice charts and reports.
DMI Ice Service or Ice Patrol Narsarsuaq can be contacted for information about issued or planned ice charts.
DMI Ice Service, Copenhagen:

- Ice Charting. Primarily based on information received from radar carrying satellites[1].

Ice Patrol Narsarsuaq, Greenland:

- Inshore Ice Report.
- Reduced Ice Report.
- Ice piloting by helicopter, primarily for inshore sailing routes in South Greenland[1]
- Distribution of Ice Charts, Inshore Ice Report and Reduced Ice Report.

Note: Additional ice charts and ice piloting can be obtained and this special service must generally be ordered no less than three days in advance.

Ice Charts
Cape Farewell Area: Covers the waters around Cape Farewell: primarily from Paamiut (Frederikshåb) along the west coast to Cape Farewell and to Tingmiarmiut along the east coast, south of 62°N.
West Coast Area:
Covers areas on the west coast of Greenland north of 62°N. The covered areas depend on the ice situation.
East Coast Area:
Covers areas on the east coast of Greenland north of 62°N. The covered areas depend on the ice situation.

Reduced Ice Report
The Reduced Ice Report indicates the outer limits of sea ice concentrations and is prepared for a new update of the Cape Farewell ice chart.

Inshore Ice Report
The Inshore Ice Report covers the inshore routes in the southern part of Greenland:
Paamiut - Tôrnârssuk - Qaqortoq - Nanortalik - Prins Christians Sund.
Before any flight it will be determined what exact area will be covered, according to the ice situation and traffic in the area.

NAVTEX:
Ice Reports are broadcast using NAVTEX, see Radio Weather Services and Navigational Warnings section, GREENLAND.

Coastal radio stations:
On request Ice Reports can be obtained in English, Greenlandic and Danish from Aasiaat radio station H24, see Radio Weather Services and Navigational Warnings section, GREENLAND.

Ice charts via Fax:
In order to poll ice information from Ice Patrol Narsarsuaq:
Fax: +299 665344 Cape Farewell Ice Chart , the weekly Greenlandic ice chart and most recent Inshore Ice Report.
Fax: +299 665247 East and west coast ice charts, the weekly Greenlandic ice chart and most recent Inshore Ice Report.

Ice Charts via e-mail:
The Ice Patrol Narsarsuaq is able to send ice charts by e-mail in pdf format. (One chart needs about 20 kB in 100 dpi and about 90 kB in 300 dpi). Any vessel, company or other users may sign up for the e-mail distribution.
Please specify which chart(s) should be included in the distribution (Cape Farewell, east coast or west coast).
Contact: e-mail: isc@greennet.gl

Internet:
All ice charts and inshore ice reports can be obtained via Internet.

www.dmi.dk/en/groenland/hav/ice-charts:	Ice Charts
www.dmi.dk/groenland/hav/ismelding:	Inshore Ice Report, only available in Danish. The Inshore Ice Report can be made in English on request to Ice Patrol Narsarsuaq.

Communication between the Ice Patrol helicopter and commercial vessels:
The helicopter can be contacted on VHF Channel 16, call sign: ISRECCO
Contact Information

Telephone:	+299 665244, +299 665247 or +881 631420563 (Satellite Telephone)	Ice Patrol Narsarsuaq for ice conditions during office hours, Mon–Fri: 0800–1200, 1300–1600 LT. Ice Patrol Narsarsuaq may also be contacted outside office hours in urgent cases.
	+45 39157315	DMI Ice Service can be contacted for planned ice charts and requests for further ice information.
e-mail:	isc@greennet.gl	Ice Patrol Narsarsuaq
	iskort@dmi.dk	DMI Ice Service
Website:	www.dmi.dk/en/groenland/hav/ice-charts	

RUSSIA (NORTHERN SEA ROUTE)

Diagram page 309

Overview

The Northern Sea Route (NSR), is traditionally a major transport corridor for Russia, but in recent years is rapidly becoming an alternative route between the ports of Europe and South-East Asia. Shipping is attracted mainly by the significant reduction in voyage time and associated costs, as well as the absence of threats from pirates.

The NSR comprises all routes from the Barents to the Chukchi Sea and the Bering Strait suitable for shipping. It includes the Arctic seas and part of the Arctic Ocean, limited by the Russian economic zone. The NSR is divided into the West and East regions as follows:

West Region:

This stretches from the meridian of Cape Zhelaniya, eastern coastline of the Novaya Zemlya archipelago and the western boundaries of the straits of Matochkin Shar, Kara Strait, Yugorskiy Shar to 125°E. It includes stretches of the Yenisei River to the port of Dudinka, the Khatanga River to the port of Khatanga and the Ob Gulf to the line connecting capes Kamenniy and Trekhbugorniy.

East Region:

This stretches from 125°E to the parallel of Dezhnev Cap in the Bering Strait, including sections of the Kolyma River to the port of Zelyonyi Mys.

The Northern Sea Route Administration

Ships wishing to transit via the NSR should first contact the Northern Sea Route Administration, using the contact details listed below, in order to understand the regulations for navigating in these waters. The NSRA was established by the Russian Federation and has the following main functions within the NSR waters:

1. Obtaining and considering the submitted applications and issuing the permissions for navigation through the NSR.
2. Issuing the certificates of the ice pilotage.
3. Researching weather, ice, navigational and other conditions.
4. Coordination of installation of navigational aids and harmonisation of regions to carry out hydrographic surveys operations.
5. Assistance in the organization of search and rescue operations.
6. Assistance in eliminating the consequences of pollution from vessels of harmful substances, sewage or garbage.
7. Providing the information services in relation to the waters of the NSR, e.g. the organisation of navigation, requirements of safe navigation etc.
8. Making recommendations about development of routes of navigation, use of the icebreaking fleet and navigational conditions.
9. Timely data retrieval, from Russian hydrometeorological services and provision of hydrometeorological forecasts and ice analysis.

The NSRA website includes a wealth of useful information, in both Russian and English, including: current information, icebreaker assistance/pilotage, navigational information, ice/weather forecasts, SAR and pollution reporting contacts.

CONTACT DETAILS:

Northern Sea Route Administration
3/6 Petrovka St., Moscow, Russia, 109544.
Tel/Fax: +7 (0)495 6261069
E-mail: nsra@morflot.ru *(for applications to navigate the NSR waters)*
nsra-info@morflot.ru *(for sending the daily captain's report at 1200 Moscow LT)*
LukashinaAN@morflot.ru *(for all messages except applications)*
Website: www.nsra.ru/en/celi_funktsii/

Ice-breakers:

Name:	**Admiral Makarov**	Name:	**Vaigach**	Name:	**Dranitsyn**
Shipping Company:	OAO (FESCO)	Shipping Company:	FSUE (Atomflot)	Shipping Company:	FSUE (Rosmorport)
Call Sign:	UGSN	Call Sign:	UBNY	Call Sign:	UCJP
MMSI:	273148110	MMSI:	273133100	MMSI:	273138300
Inmarsat C:	427302057	Inmarsat C:	–	Inmarsat C:	–
Inmarsat F77:	764626488	Inmarsat F77:	764715293	Inmarsat F77:	761137871
	764626489		764715295		761137873
	754626490				
Inmarsat F77 Fax:	764626491	Inmarsat F77 Fax:	764715296	Inmarsat F77 Fax:	761137874

Name:	**Taimyr**	Name:	**Yamal**	Name:	**Krasin**
Shipping Company:	FSUE (Atomflot)	Shipping Company:	FSUE (Atomflot)	Shipping Company:	OAO (FESCO)
Call Sign:	UEMM	Call Sign:	UCJT	Call Sign:	UIFY
MMSI:	273135100	MMSI:	273132400	MMSI:	273143900
Inmarsat C:	–	Inmarsat C:	–	Inmarsat C:	427321058
Inmarsat F77:	761142068	Inmarsat F77:	761136943	Inmarsat F77:	764596070
	761142070		761136945		764596071
					764596072
Inmarsat F77 Fax:	761142071	Inmarsat F77 Fax:	761136946	Inmarsat F77 Fax:	764596073

Name:	**50 Let Pobedy**
Shipping Company:	FSUE (Atomflot)
Call Sign:	UGYU
MMSI:	273316240
Inmarsat C:	427351996
Inmarsat F77:	764660542
	764660543
	761120938
	761120939


NORTHERN SEA ROUTE
10° 20° 30° 40° 50° 60° 70° 80° 90° 100° 110° 120° 130° 140° 150° 160° 170° 180° 170°
80°
70°
60°
50°
Northern Sea Route
Northern Sea Route
Yugorskiy
Shar
Tiksi
Murmansk
Arkhangel'sk
St. Petersburg
RUSSIA
Anadyr
Sea of Okhotsk
Petropavlovsk
-kamchatskiy
DRAFT
DRAFT
V3(1)NSEAROUTE V001 25/02/16

TABLES

BEAUFORT NOTATION

Beaufort Letters	Weather
b	Blue sky (0–1) clouded.
bc	Sky partly (1–3) clouded.
c	Cloudy (more than 3 clouded).
d	Drizzle.
e	Wet air (without precipitation).
f	Fog.
fs	Fog over sea (coast station).
fg	Fog over low ground (inland station).
g	Gale (Beaufort Force 8 or 9 maintained for period of not less than 10 minutes).
G	Storm (Beaufort Force 10 maintained for period of not less than 10 minutes).
h	Hail.
jp	Precipitation in sight of station.
kq	Line squall.
ks	Storm of drifting snow.
kz	Sandstorm or dust storm.
l	Lightning.
m	Mist.
o	Overcast sky (i.e. completely covered with a uniform layer of thick or heavy cloud).
p	Passing showers.
q	Squally weather.
r	Rain.
rs	Sleet.
s	Snow.
t	Thunder.
tlr *or* **tls**	Thunderstorm with rain or snow.
u	Ugly, threatening sky.
v	Unusual visibility.
w	Dew.
x	Hoar frost.
y	Dry air.
z	Haze.

BEAUFORT SCALE OF WIND FORCE

Beaufort force	Descriptive Term	Mean velocity		SPECIFICATIONS	Probable wave height* in metres
		Knots	m/s		
0	Calm	<1	0–0·2	Sea like a mirror.	—
1	Light air	1–3	0·3–1·5	Ripples with the appearance of scales are formed, but without foam crests.	0·1 (0·1)
2	Light breeze	4–6	1·6–3·3	Small wavelets, still short but more pronounced; crests have a glassy appearance and do not break.	0·2 (0·3)
3	Gentle breeze	7–10	3·4–5·4	Large wavelets; crests begin to break; foam of glassy appearance; perhaps scattered white horses.	0·6 (1)
4	Moderate breeze	11–16	5·5–7·9	Small waves, becoming longer; fairly frequent white horses.	1 (1·5)
5	Fresh breeze	17–21	8·0–10·7	Moderate waves, taking a more pronounced long form; many white horses are formed (chance of some spray).	2 (2·5)
6	Strong breeze	22–27	10·8–13·8	Large waves begin to form; the white foam crests are more extensive everywhere (probably some spray).	3 (4)
7	Near gale	28–33	13·9–17·1	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind.	4 (5·5)
8	Gale	34–40	17·2–20·7	Moderately high waves of greater length; edges of crests begin to break into the spindrift; the foam is blown in well-marked streaks along the direction of the wind.	5·5 (7·5)
9	Strong gale	41–47	20·8–24·4	High waves; dense streaks of foam along the direction of the wind; crests of waves begin to topple, tumble and roll over; spray may affect visibility.	7 (10)

Continued on next page

10	Storm	48–55	24·5–28·4	Very high waves with long overhanging crests; the resulting foam, in great patches, is blown in dense white streaks along the direction of the wind; on the whole, the surface of the sea takes a white appearance; the tumbling of the sea becomes heavy and shock-like; visibility affected.	9 (12·5)
11	Violent storm	56–63	28·5–32·6	Exceptionally high waves (small and medium-sized vessels might be for a time lost to view behind the waves); the sea is completely covered with long white patches of foam lying along the direction of the wind; everywhere the edges of the wave crests are blown into froth; visibility affected.	11·5 (16)
12	Hurricane	64 and over	32·7 and over	The air is filled with foam and spray; sea completely white with driving spray; visibility very seriously affected.	14 (—)

* This table is only intended as a guide to show roughly what may be expected in the open sea, remote from land. It should never be used in the reverse way; i.e. for logging or reporting the state of the sea. In enclosed waters, or when near land, with an off-shore wind, wave heights will be smaller and the waves steeper. Figures in brackets indicate the probable/maximum height of waves.

WAVES

DESCRIPTIVE TERMS REFERRING TO WAVES

(A) For length of SWELL waves:

	Length in feet	*Length in metres*
Short	0–300	0–100
Average	300–600	100–200
Long	over 600	over 200

(B) For height of SWELL waves:

	Height in feet	*Height in metres*
Low	0–7	0–2
Moderate	7–13	2-4
Heavy	over 13	over 4

(C) For height of SEA waves:

Code Figure	*Height in feet*	*Height in metres**
0. Calm—glassy	0	0
1. Calm—rippled	0 – ⅓	0 – 0·1
2. Smooth—wavelets	⅓ – 1	0·1 – 0·5
3. Slight	1 ⅔ – 4	0·5 – 1·25
4. Moderate	4 – 8	1·25 – 2·5
5. Rough	8 – 13	2·5 – 4
6. Very rough	13 – 20	4 – 6
7. High	20 – 30	6 – 9
8. Very high	30 – 45	9 – 14
9. Phenomenal	over 45	over 14

*The average wave height as obtained from the large well-formed waves of the wave system being observed.

Note — In all cases the exact bounding length or height is included in the lower category, e.g. a sea of 4 m (13 feet) is described as “Rough”.

Some authorities may give the height of the waves in feet or metres instead of the above descriptive terms.

CONVERSION TABLES

TABLE FOR CONVERSION OF DEGREES FAHRENHEIT (F.) INTO DEGREES CELSIUS (C.) AND DEGREES ABSOLUTE (K.)

F.	C.	K.	F.	C.	K.	F.	C.	K.	F.	C.	K.
20	-6·7	266·3	**45**	7·2	280·2	**70**	21·1	294·1	**95**	35·0	308·0
21	-6·1	266·9	**46**	7·8	280·8	**71**	21·7	294·7	**96**	35·6	308·6
22	-5·6	267·4	**47**	8·3	281·3	**72**	22·2	295·2	**97**	36·1	309·1
23	-5·0	268·0	**48**	8·9	281·9	**73**	22·8	295·8	**98**	36·7	309·7
24	-4·4	268·6	**49**	9·4	282·4	**74**	23·3	296·3	**99**	37·2	310·2
25	-3·9	269·1	**50**	10·0	283·0	**75**	23·9	296·9	**100**	37·8	310·8
26	-3·3	269·7	**51**	10·6	283·6	**76**	24·4	297·4	**101**	38·3	311·3
27	-2·8	270·2	**52**	11·1	284·1	**77**	25·0	298·0	**102**	38·9	311·9
28	-2·2	270·8	**53**	11·7	284·5	**78**	25·6	298·6	**103**	39·4	312·4
29	-1·7	271·3	**54**	12·2	285·2	**79**	26·1	299·1	**104**	40·0	313·0
30	-1·1	271·9	**55**	12·8	285·8	**80**	26·7	299·7	**105**	40·6	313·6
31	-0·6	272·4	**56**	13·3	286·3	**81**	27·2	300·2	**106**	41·1	314·1
32	0·0	273·0	**57**	13·9	286·9	**82**	27·8	300·8	**107**	41·7	314·7
33	+0·6	273·6	**58**	14·4	287·4	**83**	28·3	301·3	**108**	42·2	315·2
34	1·1	274·1	**59**	15·0	288·0	**84**	28·9	301·9	**109**	42·8	315·8
35	1·7	274·7	**60**	15·6	288·6	**85**	29·4	302·4	**110**	43·3	316·3
36	2·2	275·2	**61**	16·1	289·1	**86**	30·0	303·0	**111**	43·9	316·9
37	2·8	275·8	**62**	16·7	289·7	**87**	30·6	303·6	**112**	44·4	317·4
38	3·3	276·3	**63**	17·2	290·2	**88**	31·1	304·1	**113**	45·0	318·0
39	3·9	276·9	**64**	17·8	290·8	**89**	31·7	304·7	**114**	45·6	318·6
40	4·4	277·4	**65**	18·3	291·3	**90**	32·2	305·2	**115**	46·1	319·1
41	5·0	278·0	**66**	18·9	291·9	**91**	32·8	305·8	**116**	46·7	319·7
42	5·6	278·6	**67**	19·4	292·4	**92**	33·3	306·3	**117**	47·2	320·2
43	6·1	279·1	**68**	20·0	293·0	**93**	33·9	306·9	**118**	47·8	320·8
44	6·7	279·7	**69**	20·6	293·6	**94**	34·4	307·4	**119**	48·3	321·3

TABLE FOR CONVERSION OF RAINFALL IN INCHES INTO MILLIMETRES

Inches	·00	·01	·02	·03	·04	·05	·06	·07	·08	·09
	Millimetres									
0·0	0·00	0·25	0·51	0·76	1·02	1·27	1·52	1·78	2·03	2·29
0·1	2·54	2·79	3·05	3·30	3·56	3·81	4·06	4·32	4·57	4·83
0·2	5·08	5·33	5·59	5·84	6·10	6·35	6·60	6·86	7·11	7·37
0·3	7·62	7·87	8·13	8·38	8·64	8·89	9·14	9·40	9·65	9·91
0·4	10·16	10·41	10·67	10·92	11·18	11·43	11·68	11·94	12·19	12·45
0·5	12·70	12·95	13·21	13·46	13·72	13·97	14·22	14·48	14·73	14·99
0·6	15·24	15·49	15·75	16·00	16·26	16·51	16·76	17·02	17·27	17·53
0·7	17·78	18·03	18·29	18·54	18·80	19·05	19·30	19·56	19·81	20·07
0·8	20·32	20·57	20·83	21·08	21·34	21·59	21·84	22·10	22·35	22·61
0·9	22·86	23·11	23·37	23·62	23·88	24·13	24·38	24·64	24·89	25·15
1·0	25·40	25·65	25·91	26·16	26·42	26·67	26·92	27·18	27·43	27·69
1·1	27·94	28·19	28·45	28·70	28·96	29·21	29·46	29·72	29·97	30·23
1·2	30·48	30·73	30·99	31·24	31·50	31·75	32·00	32·26	32·51	32·77
1·3	33·02	33·27	33·53	33·78	34·04	34·29	34·54	34·80	35·05	35·31
1·4	35·56	35·81	36·07	36·32	36·58	36·83	37·08	37·34	37·59	37·85
1·5	38·10	38·35	38·61	38·86	39·12	39·37	39·62	39·88	40·13	40·39
1·6	40·64	40·89	41·15	41·40	41·66	41·91	42·16	42·42	42·67	42·93
1·7	43·18	43·43	43·69	43·94	44·20	44·45	44·70	44·90	45·21	45·47
1·8	45·72	45·97	46·23	46·48	46·74	46·99	47·24	47·50	47·75	48·01
1·9	48·26	48·51	48·77	49·02	49·28	49·53	49·78	50·04	50·29	50·55
2·0	50·80	51·05	51·31	51·56	51·82	52·07	52·32	52·58	52·83	53·09

TABLE FOR CONVERTING BAROMETRIC READINGS IN INCHES INTO MILLIMETRES

Inches	·00	·01	·02	·03	·04	·05	·06	·07	·08	·09
	Millimetres									
27·0	685·8	686·0	686·3	686·6	686·8	687·1	687·3	687·6	687·8	688·1
·1	688·3	688·6	688·8	689·1	689·3	689·6	689·9	690·1	690·4	690·6
·2	690·9	691·1	691·4	691·6	691·9	692·1	692·4	692·7	692·9	693·2
·3	693·4	693·7	693·9	694·2	694·4	694·7	694·9	695·2	695·4	695·7
·4	696·0	696·2	696·5	696·7	697·0	697·2	697·5	697·7	697·9	698·2
·5	698·5	698·7	699·0	699·3	699·5	699·8	700·1	700·3	700·5	700·8
·6	701·0	701·3	701·5	701·8	702·0	702·3	702·6	702·8	703·1	703·3
·7	703·6	703·8	704·1	704·3	704·6	704·8	705·1	705·4	705·6	705·9
·8	706·1	706·4	706·6	706·9	707·1	707·4	707·6	707·9	708·1	708·4
·9	708·7	708·9	709·2	709·4	709·7	709·9	710·2	710·4	710·7	710·9
28·0	711·2	711·4	711·7	712·0	712·2	712·5	712·7	713·0	713·2	713·5
·1	713·7	714·0	714·2	714·5	714·7	715·0	715·3	715·5	715·8	716·0
·2	716·3	716·5	716·8	717·1	717·3	717·5	717·8	718·0	718·3	718·6
·3	718·8	719·1	719·3	719·6	719·8	720·1	720·3	720·6	720·8	721·1
·4	721·4	721·6	721·9	722·1	722·4	722·6	722·9	723·1	723·4	723·6
·5	723·9	724·1	724·4	724·7	724·9	725·2	725·4	725·7	725·9	726·2
·6	726·4	726·7	726·9	727·2	727·4	727·7	728·0	728·2	728·5	728·7
·7	729·0	729·2	729·5	729·7	729·9	730·2	730·5	730·7	731·0	731·3
·8	731·5	731·8	732·0	732·3	732·5	732·8	733·0	733·3	733·5	733·8
·9	734·1	734·3	734·6	734·8	735·1	735·3	735·6	735·8	736·1	736·3
29·0	736·6	736·8	737·1	737·4	737·6	737·9	738·1	738·4	738·6	738·9
·1	739·1	739·4	739·6	739·9	740·1	740·4	740·7	740·9	741·2	741·4
·2	741·7	741·9	742·2	742·4	742·7	742·9	743·2	743·4	743·7	744·0
·3	744·2	744·5	744·7	745·0	745·2	745·5	745·7	745·9	746·2	746·5
·4	746·8	747·0	747·3	747·5	747·7	748·1	748·3	748·5	748·8	749·0
·5	749·3	749·5	749·8	750·1	750·3	750·6	750·8	751·1	751·3	751·6
·6	751·8	752·1	752·3	752·6	752·8	753·1	753·4	753·6	753·9	754·1
·7	754·4	754·6	754·8	755·1	755·4	755·6	755·9	756·1	756·4	756·7
·8	756·9	757·2	757·4	757·7	757·9	758·2	758·4	758·7	758·9	759·2
·9	759·5	759·7	760·0	760·2	760·5	760·7	761·0	761·2	761·5	761·7
30·0	762·0	762·2	762·5	762·8	763·0	763·3	763·5	763·8	764·0	764·3
·1	764·5	764·8	765·0	765·3	765·5	765·8	766·1	766·3	766·6	766·8
·2	767·1	767·3	767·6	767·8	768·1	768·3	768·6	768·8	769·1	769·4
·3	769·6	769·9	770·1	770·4	770·6	770·9	771·1	771·4	771·6	771·9
·4	772·2	772·4	772·7	772·9	773·2	773·4	773·7	773·9	774·2	774·4
·5	774·7	774·9	775·2	775·5	775·7	776·0	776·2	776·5	776·7	777·0
·6	777·2	777·5	777·7	778·0	778·2	778·5	778·8	779·0	779·3	779·5
·7	779·8	780·0	780·3	780·5	780·8	781·0	781·3	781·5	781·8	782·1
·8	782·3	782·6	782·8	783·1	783·3	783·6	783·8	784·1	784·3	784·6
·9	784·9	785·1	785·4	785·6	785·9	786·2	786·4	786·6	786·9	787·1
31·0	787·4	787·6	787·9	788·2	788·4	788·7	788·9	789·2	789·4	789·7
·1	789·9	790·2	790·4	790·7	790·9	791·2	791·5	791·7	792·0	792·2
·2	792·5	792·7	793·0	793·2	793·5	793·7	794·0	794·2	794·5	794·8
·3	795·1	795·3	795·5	795·8	796·0	796·3	796·5	796·8	797·0	797·3
·4	797·6	797·8	798·1	798·3	798·6	798·8	799·1	799·3	799·6	799·8

TABLE FOR CONVERTING BAROMETRIC READINGS IN INCHES INTO HECTOPASCALS

(Equivalents of Hectopascals in Inches of Mercury at 32°F and Standard Gravity 980·665 cm/sec^2.)

Mercury Inches	·00	·01	·02	·03	·04	·05	·06	·07	·08	·09
	Hectopascals									
27·0	914·3	914·7	915·0	915·3	915·7	916·0	916·4	916·7	917·0	917·4
27·1	917·7	918·1	918·4	918·7	919·1	919·4	919·7	920·1	920·4	920·8
27·2	921·1	921·4	921·8	922·1	922·5	922·8	923·1	923·5	923·8	924·1
27·3	924·5	924·8	925·2	925·5	925·8	926·2	926·5	926·9	927·2	927·5
27·4	927·9	928·2	928·5	928·9	929·2	929·6	929·9	930·2	930·6	930·9
27·5	931·3	931·6	931·9	932·3	932·6	933·0	933·3	933·6	934·0	934·3
27·6	934·6	935·0	935·3	935·7	936·0	936·3	936·7	937·0	937·4	937·7
27·7	938·0	933·4	938·7	939·0	939·4	939·7	940·1	940·4	940·7	941·1
27·8	941·4	941·8	942·1	942·4	942·8	943·1	943·4	943·8	944·1	944·5
27·9	944·8	945·1	945·5	945·8	946·2	946·5	946·8	947·2	947·5	947·9
28·0	948·2	948·5	948·9	949·2	949·5	949·9	950·2	950·6	950·9	951·2
28·1	951·6	951·9	952·3	952·6	952·9	953·3	953·6	953·9	954·3	954·6
28·2	955·0	955·3	955·6	956·0	956·3	956·7	957·0	957·3	957·7	958·0
28·3	958·3	958·7	959·0	959·4	959·7	960·0	960·4	960·7	961·1	961·4
28·4	961·7	962·1	962·4	962·8	963·1	963·4	963·8	964·1	964·4	964·8
28·5	965·1	965·5	965·8	966·1	966·5	966·8	967·2	967·5	967·8	968·2
28·6	968·5	968·8	969·2	969·5	969·9	970·2	970·5	970·9	971·2	971·6
28·7	971·9	972·2	972·6	972·9	973·2	973·6	973·9	974·3	974·6	974·9
28·8	975·3	975·6	976·0	976·3	976·6	977·0	977·3	977·7	978·0	978·3
28·9	978·7	979·0	979·3	979·7	980·0	980·4	980·7	981·0	981·4	981·7
29·0	982·1	982·4	982·7	983·1	983·4	983·7	984·1	984·4	984·8	985·1
29·1	985·4	985·8	986·1	986·5	986·8	987·1	987·5	987·8	988·1	988·5
29·2	988·8	989·2	989·5	989·8	990·2	990·5	990·9	991·2	991·5	991·9
29·3	992·2	992·6	992·9	993·2	993·6	993·9	994·2	994·6	994·9	995·3
29·4	995·6	995·9	996·3	996·6	997·0	997·3	997·6	998·0	998·3	998·6
29·5	999·0	999·3	999·7	1000·0	1000·3	1000·7	1001·0	1001·4	1001·7	1002·0
29·6	1002·4	1002·7	1003·0	1003·4	1003·7	1004·1	1004·4	1004·7	1005·1	1005·4
29·7	1005·8	1006·1	1006·4	1006·8	1007·1	1007·5	1007·8	1008·1	1008·5	1008·8
29·8	1009·1	1009·5	1009·8	1010·2	1010·5	1010·8	1011·2	1011·5	1011·9	1012·2
29·9	1012·5	1012·9	1013·2	1013·5	1013·9	1014·2	1014·6	1014·9	1015·2	1015·6
30·0	1015·9	1016·3	1016·6	1016·9	1017·3	1017·6	1017·9	1018·3	1018·6	1019·0
30·1	1019·3	1019·6	1020·0	1020·3	1020·7	1021·0	1021·3	1021·7	1022·0	1022·4
30·2	1022·7	1023·0	1023·4	1023·7	1024·0	1024·4	1024·7	1025·1	1025·4	1025·7
30·3	1026·1	1026·4	1026·8	1027·1	1027·4	1027·8	1028·1	1028·4	1028·8	1029·1
30·4	1029·5	1029·8	1030·1	1030·5	1030·8	1031·2	1031·5	1031·8	1032·2	1032·5
30·5	1032·8	1033·2	1033·5	1033·9	1034·2	1034·5	1034·9	1035·2	1035·6	1035·9
30·6	1036·2	1036·6	1036·9	1037·3	1037·6	1037·9	1038·3	1038·6	1038·9	1039·3
30·7	1039·6	1040·0	1040·3	1040·6	1041·0	1041·3	1041·7	1042·0	1042·3	1042·7
30·8	1043·0	1043·3	1043·7	1044·0	1044·4	1044·7	1045·0	1045·4	1045·7	1046·1
30·9	1046·4	1046·7	1047·1	1047·4	1047·7	1048·1	1048·4	1048·8	1049·1	1049·4
Thousandths of an inch										
Mercury Inches		**·001**	**·002**	**·003**	**·004**	**·005**	**·006**	**·007**	**·008**	**·009**
Hectopascals		·0	·1	·1	·1	·2	·2	·2	·3	·3

TABLE FOR CONVERTING BAROMETRIC READINGS IN MILLIMETRES INTO HECTOPASCALS

(Equivalents of Hectopascals in Millimetres of Mercury at 32°F and Standard Gravity 980·665 cm/sec^2.)

Millimetres	0·0	0·1	0·2	0·3	0·4	0·5	0·6	0·7	0·8	0·9
	Hectopascals									
710	946·6	946·7	946·9	947·0	947·1	947·3	947·4	947·5	947·7	947·8
711	947·9	948·1	948·2	948·3	948·5	948·6	948·7	948·9	949·0	949·1
712	949·3	949·4	949·5	949·7	949·8	949·9	950·1	950·2	950·3	950·5
713	950·6	950·7	950·9	951·0	951·1	951·3	951·4	951·5	951·7	951·8
714	951·9	952·1	952·2	952·3	952·5	952·6	952·7	952·9	953·0	953·1
715	953·3	953·4	953·5	953·7	953·8	953·9	954·1	954·2	954·3	954·5
716	954·6	954·7	954·9	955·0	955·1	955·3	955·4	955·5	955·7	955·8
717	955·9	956·1	956·2	956·3	956·5	956·6	956·7	956·9	957·0	957·1
718	957·3	957·4	957·5	957·7	957·8	957·9	958·1	958·2	958·3	958·5
719	958·6	958·7	958·9	959·0	959·1	959·3	959·4	959·5	959·7	959·8
720	959·9	960·1	960·2	960·3	960·5	960·6	960·7	960·9	961·0	961·1
721	961·3	961·4	961·5	961·7	961·8	961·9	962·1	962·2	962·3	962·5
722	962·6	962·7	962·9	963·0	963·1	963·3	963·4	963·5	963·7	963·8
723	963·9	964·1	964·2	964·3	964·5	964·6	964·7	964·9	965·0	965·1
724	965·3	965·4	965·5	965·7	965·8	965·9	966·1	966·2	966·3	966·4
725	966·6	966·7	966·9	967·0	967·1	967·3	967·4	967·5	967·7	967·8
726	967·9	968·1	968·2	968·3	968·5	968·6	968·7	968·9	969·0	969·1
727	969·3	969·4	969·5	969·7	969·8	969·9	970·1	970·2	970·3	970·5
728	970·6	970·7	970·9	971·0	971·1	971·3	971·4	971·5	971·7	971·8
729	971·9	972·1	972·2	972·3	972·5	972·6	972·7	972·9	973·0	973·1
730	973·3	973·4	973·5	973·7	973·8	973·9	974·1	974·2	974·3	974·5
731	974·6	974·7	974·9	975·0	975·1	975·3	975·4	975·5	975·7	975·8
732	975·9	976·1	976·2	976·3	976·5	976·6	976·7	976·9	977·0	977·1
733	977·3	977·4	977·5	977·7	977·8	977·9	978·1	978·2	978·3	978·5
734	978·6	978·7	978·9	979·0	979·1	979·3	979·4	979·5	979·7	979·8
735	979·9	980·1	980·2	980·3	980·4	980·6	980·7	980·8	981·0	981·1
736	981·2	981·4	981·5	981·6	981·8	981·9	982·0	982·2	982·3	982·4
737	982·6	982·7	982·8	983·0	983·1	983·2	983·4	983·5	983·6	983·8
738	983·9	984·0	984·2	984·3	984·4	984·6	984·7	984·8	985·0	985·1
739	985·2	985·4	985·5	985·6	985·8	985·9	986·0	986·2	986·3	986·4
740	986·6	986·7	986·8	987·0	987·1	987·2	987·4	987·5	987·6	987·8
741	987·9	988·0	988·2	988·3	988·4	988·6	988·7	988·8	989·0	989·1
742	989·2	989·4	989·5	989·6	989·8	989·9	990·0	990·2	990·3	990·4
743	990·6	990·7	990·8	991·0	991·1	991·2	991·4	991·5	991·6	991·8
744	991·9	992·0	992·2	992·3	992·4	992·6	992·7	992·8	993·0	993·1
745	993·2	993·4	993·5	993·6	993·8	993·9	994·0	994·2	994·3	994·4
746	994·6	994·7	994·8	995·0	995·1	995·2	995·4	995·5	995·6	995·8
747	995·9	996·0	996·2	996·3	996·4	996·6	996·7	996·8	997·0	997·1
748	997·2	997·4	997·5	997·6	997·8	997·9	998·0	998·2	998·3	998·4
749	998·6	998·7	998·8	999·0	999·1	999·2	999·4	999·5	999·6	999·8
750	999·9	1000·0	1000·2	1000·3	1000·4	1000·6	1000·7	1000·8	1001·0	1001·1
751	1001·2	1001·4	1001·5	1001·6	1001·8	1001·9	1002·0	1002·2	1002·3	1002·4
752	1002·6	1002·7	1002·8	1003·0	1003·1	1003·2	1003·4	1003·5	1003·6	1003·8
753	1003·9	1004·0	1004·2	1004·3	1004·4	1004·6	1004·7	1004·8	1005·0	1005·1
754	1005·2	1005·4	1005·5	1005·6	1005·8	1005·9	1006·0	1006·2	1006·3	1006·4
755	1006·6	1006·7	1006·8	1007·0	1007·1	1007·2	1007·4	1007·5	1007·6	1007·8
756	1007·9	1008·0	1008·2	1008·3	1008·4	1008·6	1008·7	1008·8	1009·0	1009·1
757	1009·2	1009·4	1009·5	1009·6	1009·8	1009·9	1010·0	1010·2	1010·3	1010·4
758	1010·6	1010·7	1010·8	1011·0	1011·1	1011·2	1011·4	1011·5	1011·6	1011·8
759	1011·9	1012·0	1012·2	1012·3	1012·4	1012·6	1012·7	1012·8	1013·0	1013·1
760	1013·2	1013·4	1013·5	1013·6	1013·8	1013·9	1014·0	1014·2	1014·3	1014·4
761	1014·6	1014·7	1014·8	1015·0	1015·1	1015·2	1015·4	1015·5	1015·6	1015·8
762	1015·9	1016·0	1016·2	1016·3	1016·4	1016·6	1016·7	1016·8	1017·0	1017·1
763	1017·2	1017·4	1017·5	1017·6	1017·8	1017·9	1018·0	1018·2	1018·3	1018·4

Continued overleaf

Millimetres	0·0	0·1	0·2	0·3	0·4	0·5	0·6	0·7	0·8	0·9
	Hectopascals									
764	1018·6	1018·7	1018·8	1019·0	1019·1	1019·2	1019·4	1019·5	1019·6	1019·8
765	1019·9	1020·0	1020·2	1020·3	1020·4	1020·6	1020·7	1020·8	1021·0	1021·1
766	1021·2	1021·4	1021·5	1021·6	1021·8	1021·9	1022·0	1022·2	1022·3	1022·4
767	1022·6	1022·7	1022·8	1023·0	1023·1	1023·2	1023·4	1023·5	1023·6	1023·8
768	1023·9	1024·0	1024·2	1024·3	1024·4	1024·6	1024·7	1024·8	1025·0	1025·1
769	1025·2	1025·4	1025·5	1025·6	1025·8	1025·9	1026·0	1026·2	1026·3	1026·4
770	1026·6	1026·7	1026·8	1027·0	1027·1	1027·2	1027·4	1027·5	1027·6	1027·8
771	1027·9	1028·0	1028·2	1028·3	1028·4	1028·6	1028·7	1028·8	1029·0	1029·1
772	1029·2	1029·4	1029·5	1029·6	1029·8	1029·9	1030·0	1030·2	1030·3	1030·4
773	1030·6	1030·7	1030·8	1031·0	1031·1	1031·2	1031·4	1031·5	1031·6	1031·8
774	1031·9	1032·0	1032·2	1032·3	1032·4	1032·6	1032·7	1032·8	1033·0	1033·1
775	1033·2	1033·4	1033·5	1033·6	1033·8	1033·9	1034·0	1034·2	1034·3	1034·4
776	1034·6	1034·7	1034·8	1035·0	1035·1	1035·2	1035·4	1035·5	1035·6	1035·8
777	1035·9	1036·0	1036·2	1036·3	1036·4	1036·6	1036·7	1036·8	1037·0	1037·1
778	1037·2	1037·4	1037·5	1037·6	1037·8	1037·9	1038·0	1038·2	1038·3	1038·4
779	1038·6	1038·7	1038·8	1039·0	1039·1	1039·2	1039·4	1039·5	1039·6	1039·8
780	1039·9	1040·0	1040·2	1040·3	1040·4	1040·6	1040·7	1040·8	1041·0	1041·1
781	1041·2	1041·4	1041·5	1041·6	1041·8	1041·9	1042·0	1042·2	1042·3	1042·4
782	1042·6	1042·7	1042·8	1043·0	1043·1	1043·2	1043·4	1043·5	1043·6	1043·8
783	1043·9	1044·0	1044·2	1044·3	1044·4	1044·6	1044·7	1044·8	1045·0	1045·1
784	1045·2	1045·4	1045·5	1045·6	1045·8	1045·9	1046·0	1046·2	1046·3	1046·4
785	1046·6	1046·7	1046·8	1047·0	1047·1	1047·2	1047·4	1047·5	1047·6	1047·8
786	1047·9	1048·0	1048·2	1048·3	1048·4	1048·6	1048·7	1048·8	1049·0	1049·1
787	1049·2	1049·4	1049·5	1049·6	1049·8	1049·9	1050·0	1050·2	1050·3	1050·4
788	1050·6	1050·7	1050·8	1051·0	1051·1	1051·2	1051·4	1051·5	1051·6	1051·8
789	1051·9	1052·0	1052·2	1052·3	1052·4	1052·6	1052·7	1052·8	1053·0	1053·1

WIND VELOCITY — TABLE FOR CONVERTING KNOTS TO: MILES PER HOUR, METRES PER SECOND AND KILOMETRES PER HOUR

(1 International Nautical Mile = 6,076·12 feet = 1,852 metres)

Knots	Miles per hour	Metres per second	Kilometres per hour	Knots	Miles per hour	Metres per second	Kilometres per hour
1	1·15	0·51	1·85	**51**	58·69	26·24	94·45
2	2·30	1·03	3·70	**52**	59·84	26·75	96·30
3	3·45	1·54	5·56	**53**	60·99	27·27	98·16
4	4·60	2·06	7·41	**54**	62·14	27·78	100·01
5	5·75	2·57	9·26	**55**	63·29	28·29	101·86
6	6·90	3·09	11·11	**56**	64·44	28·81	103·71
7	8·05	3·60	12·96	**57**	65·59	29·32	105·56
8	9·21	4·12	14·82	**58**	66·74	29·84	107·42
9	10·36	4·63	16·67	**59**	67·89	30·35	109·27
10	11·51	5·14	18·52	**60**	69·05	30·87	111·12
11	12·66	5·66	20·37	**61**	70·20	31·38	112·97
12	13·81	6·17	22·22	**62**	71·35	31·90	114·82
13	14·96	6·69	24·08	**63**	72·50	32·41	116·68
14	16·11	7·20	25·93	**64**	73·65	32·92	118·53
15	17·26	7·72	27·78	**65**	74·80	33·44	120·38
16	18·41	8·23	29·63	**66**	75·95	33·95	122·23
17	19·56	8·75	31·48	**67**	77·10	34·47	124·08
18	20·71	9·26	33·34	**68**	78·25	34·98	125·94
19	21·86	9·77	35·19	**69**	79·40	35·50	127·79
20	23·02	10·29	37·04	**70**	80·55	36·01	129·64
21	24·17	10·80	38·89	**71**	81·70	36·53	131·49
22	25·32	11·32	40·74	**72**	82·86	37·04	133·34
23	26·47	11·83	42·60	**73**	84·01	37·55	135·20
24	27·62	12·35	44·45	**74**	85·16	38·07	137·05
25	28·77	12·86	46·30	**75**	86·31	38·58	138·90
26	29·92	13·38	48·15	**76**	87·46	39·10	140·75
27	31·07	13·89	50·00	**77**	88·61	39·61	142·60
28	32·22	14·40	51·86	**78**	89·76	40·13	144·46
29	33·37	14·92	53·71	**79**	90·91	40·64	146·31
30	34·52	15·43	55·56	**80**	92·06	41·16	148·16
31	35·67	15·95	57·41	**81**	93·21	41·67	150·01
32	36·82	16·46	59·26	**82**	94·36	42·18	151·86
33	37·98	16·98	61·12	**83**	95·51	42·70	153·72
34	39·13	17·49	62·97	**84**	96·67	43·21	155·57
35	40·28	18·01	64·82	**85**	97·82	43·73	157·42
36	41·43	18·52	66·67	**86**	98·97	44·24	159·27
37	42·58	19·03	68·52	**87**	100·12	44·76	161·12
38	43·73	19·55	70·38	**88**	101·27	45·27	162·98
39	44·88	20·06	72·23	**89**	102·42	45·79	164·83
40	46·03	20·58	74·08	**90**	103·57	46·30	166·68
41	47·18	21·09	75·93	**91**	104·72	46·81	168·53
42	48·33	21·61	77·78	**92**	105·87	47·33	170·38
43	49·48	22·12	79·64	**93**	107·02	47·84	172·24
44	50·63	22·64	81·49	**94**	108·17	48·36	174·09
45	51·78	23·15	83·34	**95**	109·32	48·87	175·94
46	52·94	23·66	85·19	**96**	110·47	49·39	177·79
47	54·09	24·18	87·04	**97**	111·62	49·90	179·64
48	55·24	24·69	88·90	**98**	112·78	50·42	181·50
49	56·39	25·21	90·75	**99**	113·93	50·93	183·35
50	57·54	25·72	92·60	**100**	115·08	51·44	185·20

WEATHER 'APPS'

An emerging technology exists in the form of software Weather Applications or 'Apps' for use on a number of different mobile devices. The development of such technology is intrinsically dynamic and it would be an impossible task to attempt to list all such software and its capabilities as it is released. Therefore, this section only seeks to give the mariner an overview of some of the Apps/mobile services that are provided by national weather agencies and it should be born in mind that many others are available. It should be noted that 'Apps' must be typically downloaded and installed from an online store, although some are actually free.

The mariner is strongly advised to note the points below:

1. The internet is not part of the Maritime Safety Information system and should **never** be relied upon as the only means to obtain the latest forecast and warning information. Access to the service may be interrupted or delayed from time to time, updates may also be delayed. Please refer to GMDSS services, INMARSAT SafetyNET or international NAVTEX for the latest information.
2. Some of the Apps listed below cover general and coastal weather only and **not** dedicated maritime forecasts.
3. When using these web pages and Apps, always check that the page on your screen is **not** from your cache. Use the Refresh or Reload button if in any doubt.
4. Versions available
   (a) **Android 'Apps'** refers to stand-alone applications designed to run on the operating system developed by Google for smartphones.
   (b) **iPhone 'Apps'** refers to stand-alone applications designed to run on the Apple iPhone.
   (c) **Mobile Compatible** refers to a mobile version of a standard website that is optimised for viewing on a mobile device such as a smartphone or tablet.
   (d) **Mobile (Cell) Phone Compatible** refers to a more simple text page form of a website, that is optimised for viewing on a 'standard' mobile (cell) phone.
   (e) **Tablet 'Apps'** refer to stand-alone applications designed to run on either the Apple iPad and/or Windows tablet devices as described.
5. The UKHO in no way endorses any of the products listed in this section.

Weather 'Apps' for Mobile, Tablet and iPhone Devices

World Meteorological Organisation: www.wmo.int

My WorldWeather

Overview: http://www.unric.org/en/apps-directory/27437-myworldweather-wmo
My WorldWeather is the mobile version of the World Weather Information Service (WWIS) website. The application detects the user's location and provides official city weather information for over 1700 cities around the world. The App is available in nine languages and has been developed by the Hong Kong Observatory, with assistance from the WMO.

Android Download: https://play.google.com/store/apps/details?id=hko.my_world_weather
Download the Android version of My WorldWeather.

iPhone Download: http://itunes.apple.com/ae/app/myweather/id453654229?mt=8
Download the iPhone version of My WorldWeather.

UK Met Office: www.metoffice.gov.uk

Weather Application

Overview: http://www.metoffice.gov.uk/services/mobile-digital-services/weather-app
Free to download, 5 day forecast for around 7000 UK and 6000 international locations, 3 hourly forecasts for today and up to five days ahead.

Android Download: https://play.google.com/store/apps/details?id=uk.gov.metoffice.android
Download the Android version of Met Office Weather Application.

iPhone Download: https://itunes.apple.com/gb/app/met-office-weather-application/id331122086?mt=8
Download the iPhone version of Met Office Weather Application

Mobile Compatible: http://www.metoffice.gov.uk/mobile
Provides mobile compatible Surface Pressure Charts and forecast information including: Marine observations, Gale/Storm warnings, Forecasts for Shipping, Inshore Waters, Coastal up to 60 nm of Shetland Isles, High Seas and Extended Outlook.

NOAA National Ocean Service: http://oceanservice.noaa.gov/

Overview: NOAA produces a wide range of apps and services which are of interest to the mariner including: Marine Forecasts, Hawaii Tsunami Information Service, WhaleALERT, Marine Debris Tracker and many more.

Android Download: http://oceanservice.noaa.gov/mobile.html#android
Download a wide range of Android compatible Apps which are of interest to the mariner.

iPhone and iPad Download: http://oceanservice.noaa.gov/mobile.html#iphone
Download a wide range of Apple compatible Apps and services available for iPhone and iOS devices, which are of interest to the mariner.

Mobile Compatible: http://oceanservice.noaa.gov/mobile.html
Links to a wide range of mobile compatible websites and services which are of interest to the mariner.

Mobile (Cell) Phone Compatible: http://cell.weather.gov/marine/marine.htm
NWS Marine Forecast mobile/cell phone compatible text pages for High Seas, Offshore, Navtex, Local Marine, Hurricane, Tsunami, Radiofax Charts and Buoy/C-Man observations.

MetService New Zealand: www.metservice.com

MetService Marine

Overview: http://about.metservice.com/our-company/ways-to-get-the-weather/weather-on-your-/
MetService Marine is a specific marine weather application, giving all coastal and recreational marine forecast from metservice.com. It also provides severe weather information, tides, 7·5 minute Rain Radar, 3 day rainfall forecast imagery with wind barbs, surface pressure maps. The app is developed for smartphones and does not support tablets.

Android Download: https://play.google.com/store/apps/details?id=com.metservice.marine

iPhone Download: https://itunes.apple.com/us/app/metservice-marine/id783127076?ls=1&mt=8

Mobile Compatible: http://m.metservice.com/

Brazilian Navy Hydrographic Office: https://www.mar.mil.br/dhn/chm/meteo/indexing.htm

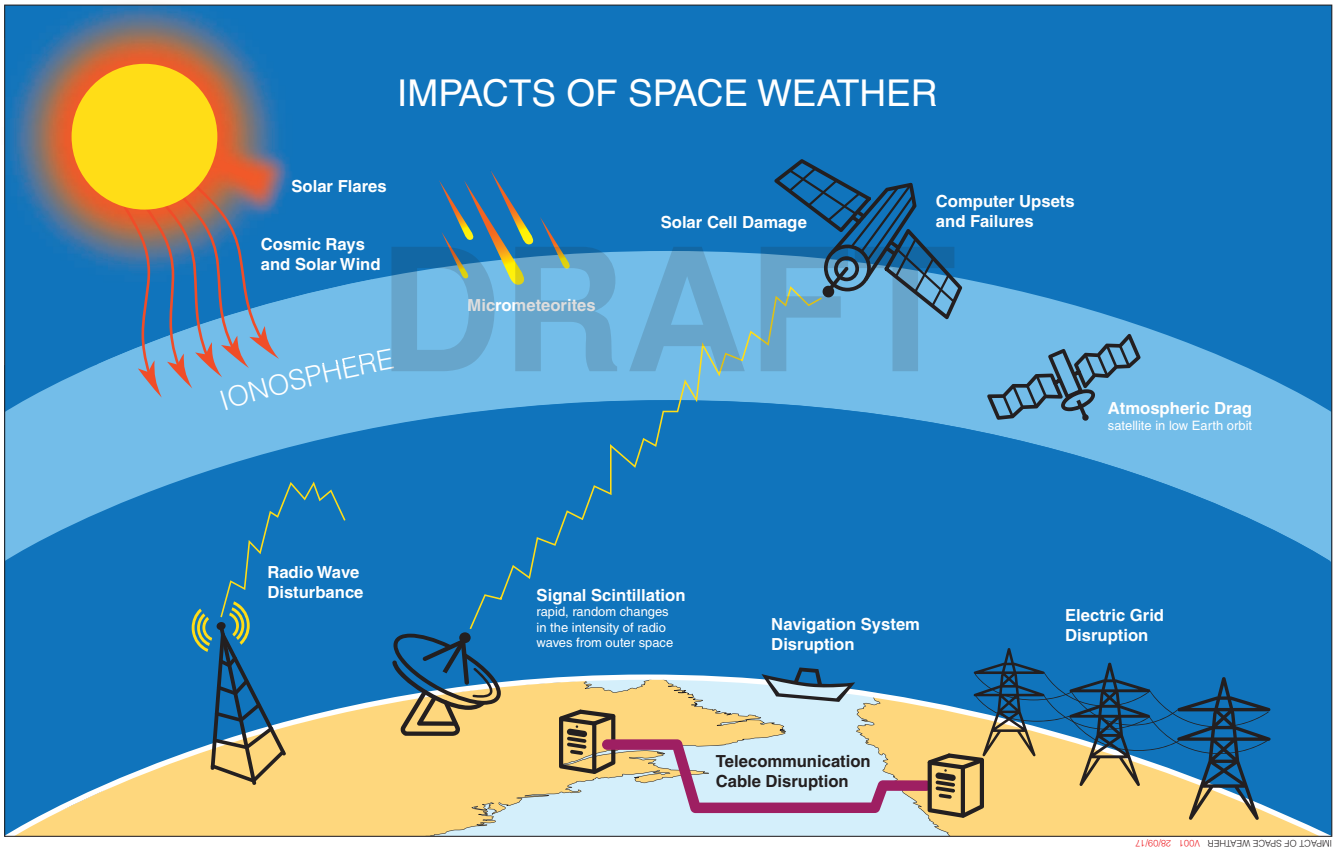
Boletim ao Mar (Sea Bulletins)

Overview: http://boletimaomar.com.br/
Boletim ao Mar is a specific marine weather app which gives access to daily bulletins on weather and sea conditions for the next 24 and 48 hour periods, it also provides marine weather warnings and Notice to Mariners for relevant Brazilian nautical publications. The app is free and is available in both Androd and Apple formats in Portuguese.

Android Download: https://play.google.com/store/apps/details?id=com.intersectio.Boletim&hl=en_GB

iPhone Download: https://itunes.apple.com/gb/app/boletim-ao-mar/id1043871953?mt=8

SPACE WEATHER



Space Weather and the Effect on Maritime Communication and Navigation

Although it may not be immediately apparent, space weather can directly impact the mariner in several ways of which they should be aware. Space weather generally begins at the sun, which produces several different phenomena which can disrupt radio and satellite communications on Earth. The most notable effects include:

The Solar Wind:

A continuous stream of charged particles release by the sun, produced as a result of its 'normal' nuclear reaction process. These particles travel at several hundred kilometers per second and can take 2-3 days to reach Earth.

Sunspots:

The Sun follows an approximate 11-year cycle of sunspots, the visible signs of an increased solar magnetic field. The period during which sunspots occur are referred to as the 'maxima' and generally last somewhere between 3-5 years, although this can vary considerably. During a sunspot maximum, solar flares can erupt.

Solar Flares:

Strong magnetic field loops often extending outside the surface of the sun which, when they break up, release huge amounts of charged matter e.g. ultraviolet light, x-rays and various other charged particles into space, at speeds much larger than the solar wind. These are called Coronal Mass Ejections or CMEs and when they are directed towards the Earth can trigger a 'geomagnetic storm'.

Electromagnetic Radiation:

Besides the outflow of the above highly charged particles, the Sun also continually emits electromagnetic radiation which travels at the speed of light, reaching the Earth in a little under 8 minutes. The extreme end of the UV and X-ray parts of the spectrum are responsible for breaking apart, or 'ionising' the molecules which form part of the upper atmosphere, into positively and negatively charged particles. This layer of the atmosphere is unsurprisingly named the 'Ionosphere' and the free charges it contains can have a major influence on radio/GPS signal paths, depending on the time of day, season and solar cycle.

Low level space weather events occur on a regular basis and usually have only minor effects. However, severe cases can cause major disruption and risk, such that most governments view it as one of the highest priority natural hazards, due to our increasing dependence on technology and the effects space weather can have on it. Space weather events have the potential for widespread failure of power supplies, radio and satellite communication blackouts, compass fluctuations, GPS navigation errors and the subsequent havoc that would be inflicted on aviation and marine traffic worldwide if one or more of the GNSS satellites were to be damaged. In 2012 the Earth had a near miss when the largest solar storm since 1859 was directed towards its orbit. If it had occurred only one week earlier, the planet would have been directly in its path . . .

Practical Effects on the Mariner:

At frequencies in the 1 to 30 MHz range, solar flares can cause changes in ionospheric density and structure, thereby modifying the path of radio signals, causing 'fading', interference and even blocking HF transmissions completely (radio blackout). Additionally, the speed at which VHF GPS signals travel through the ionosphere can be affected. The resulting delay and refraction (scintillation) of the signal's path, can lead to a decreased in the accuracy of GPS receivers of up to 100m and/or temporary loss of satellite 'lock'. This has obvious consequences for the mariner, particularly for those using dynamic positioning or navigating an area congested with hazards.

Whilst most radio frequencies will be affected to some degree by space weather, HF radio communications (and MF at night), are particularly susceptible. In a typical sequence of space weather storms, the first impacts are felt during the solar flare itself. The solar x-rays from the sun penetrate to the bottom of the ionosphere (to around 80 km), where the atmosphere is ionised and creates an increased, thicker, 'D layer'. The D-layer acts both as a reflector of radio waves at some frequencies and an absorber of waves at others. The 'radio blackout' associated with solar flares, occurs on the dayside region of Earth and is most intense when the sun is directly overhead.

Another type of space weather, the radiation storm, is caused by energetic solar protons and can also disrupt HF radio communication. The protons are guided by Earth's magnetic field so that they collide with the upper atmosphere near the north and south poles. The fast-moving protons have a similar affect to the x-ray photons and create an enhanced D-Layer, thus blocking HF radio communication at high latitudes. During aurora displays, the electrons can affect other layers of the ionosphere and have similar disrupting and blocking effects, which occur mostly on the night side of the polar regions of Earth, where the aurora is most intense and most frequent.

Satellite communications tend to use high frequency signals: Ultra High Frequency (UHF), 300 MHz to 3 GHz and Super High Frequency (SHF), 3–30 GHz. Radio signals propagating to and from a satellite in orbit are similarly affected and the results are highly variable. Up to a point, the effects of space weather on satellite communications can be mitigated through engineering design solutions, but even so, space weather can lead to a total loss of communication.

Considering that the Global Maritime Distress and Safety System relies on effective radio and satellite communication, the mariner is well advised to take space weather conditions into account.

Space Weather Forecast Scales:
NOAA (the USA's National Oceanic and Atmospheric Administration), has developed a range of scales which are sometimes referenced by other meteorological services around the world when it comes to issuing space weather predictions. These scales were developed as a way of describing the likely environmental disturbances for three main solar weather event types: radio blackouts, geomagnetic storms and solar radiation. The scales have numbered levels, similar to hurricanes and earthquakes, in order to convey their severity and may be more easily interpreted than the standard scientific technical descriptions – see diagrams.

Geomagnetic Storms

Category		Effect	Physical Measure	Average Frequency (1 cycle = 11 years)
Scale	Descriptor	Duration of event will influence severity of effects	Kp values determined every 3 hours	Number of storm events when Kp level was met (number of storm days)
G5	**Extreme**	**Power Systems:** Widespread voltage control problems, some grid systems may experience complete collapse or blackouts. Transformers may experience damage. **Comms:** HF radio blackout on the entire sunlit side of the Earth lasting for several days. **Navigation:** GPS signals errors in positioning for several days on the sunlit side of earth, which may also spread to the night side.	Kp = 9	4 per cycle (4 days per cycle)
G4	**Severe**	**Power Systems:** Possible widespread voltage control problems and some protective systems will mistakenly trip out key assets from the grid. **Comms:** HF radio propagation sporadic. **Navigation:** GPS navigation degraded for hours and low-frequency radio navigation disrupted.	Kp = 8	100 per cycle (60 days per cycle)
G3	**Strong**	**Power Systems:** Voltage corrections may be required, false alarms triggered on some protection devices. **Comms:** HF radio may be intermittent and low-frequency radio navigation problems may occur. **Navigation:** GPS and low-frequency navigation may experience intermittent problems.	Kp = 7	200 per cycle (130 days per cycle)
G2	**Moderate**	**Power Systems:** High latitude power systems may experience voltage alarms and long-term storms may cause transformer damage. **Comms:** HF radio propagation can fade at higher latitudes.	Kp = 6	600 per cycle (360 days per cycle)
G1	**Minor**	**Power Systems:** Weak power grid fluctuation can occur.	Kp = 5	1700 per cycle (900 days per cycle)

Radio Blackouts

Category		Effect	Physical Measure	Average Frequency (1 cycle = 11 years)
Scale	Descriptor	Duration of event will influence severity of effects	GOES X-ray peak brightness by class and by flux	Number of events when flux level was met (number of storm days)
R5	**Extreme**	**Comms:** HF radio complete on the entire sunlit side of the Earth lasting several hours. **Navigation:** GPS increased position errors for several hours on sunlit side of Earth, which may spread into the night side. Low-frequency navigation signals may similarly experience outages on sunlit side of Earth, causing loss in positioning.	X20 ($2x10^{-3}$)	Fewer than 1 per cycle
R4	**Severe**	**Comms:** HF radio blackout likely for several hours on most of the sunlit side of Earth. **Navigation:** GPS navigation may suffer minor disruptions on sunlit side of Earth. Low-frequency navigation signals may suffer positional degradation for several hours.	X10 (10^{-3})	8 per cycle (8 days per cycle)
R3	**Strong**	**Comms:** HF radio blackout likely for about an hour over a wide area of the sunlit side of Earth. **Navigation:** Low-frequency navigation signals may suffer positional degradation for about an hour.	X1 (10^{-4})	175 per cycle (140 days per cycle)
R2	**Moderate**	**Comms:** HF radio limited blackout on sunlit side of the Earth for tens of minutes. **Navigation:** Low-frequency navigation signals may suffer positional degradation for tens of minutes.	M5 ($5x10^{-5}$)	350 per cycle (300 days per
R1	**Minor**	**Comms:** HF radio minor degradation of signal on the sunlit side of Earth with occasional loss of contact. **Navigation:** Low-frequency navigation signals may suffer periods of brief degradation.	M1 (10^{-5})	2000 per cycle (950 days per cycle)

Solar Radiation Storms

Category		Effect	Physical Measure	Average Frequency (1 cycle = 11 years)
Scale	Descriptor	Duration of event will influence severity of effects	Flux level of ≥ 10 MeV particles (ions)	Number of events when flux level was met (number of storm days)
S5	**Extreme**	**Comms:** HF radio complete blackout possible throughout the polar regions. Sat Comms may be affected if satellites are damaged. **Navigation:** GPS satellites may be damaged or position errors may make navigation operations extremely difficult.	10^5	Fewer than 1 per cycle
S4	**Severe**	**Comms:** HF radio blackout likely in polar regions. **Navigation:** GPS navigation maybe degraded for several days.	10^4	3 per cycle
S3	**Strong**	**Comms:** HF radio degraded in polar regions. **Navigation:** GPS position errors likely.	10^3	200 per cycle (130 days per cycle)
S2	**Moderate**	**Comms:** HF radio propagation can fade at higher latitudes. **Navigation:** GPS position errors possible in polar regions.	10^2	600 per cycle (360 days per cycle)
S1	**Minor**	**Comms:** Minor impacts on HF radio in polar regions.	10	1700 per cycle (900 days per cycle)

Space Weather Forecast Useful Websites:
Some examples of space weather forecasts offered by meteorological agencies around the world can be found below, but please note that the list is not exhaustive. The main summaries on all the sites listed are available in English:

NOAA (National Oceanographic and Atmospheric Administration):
www.swpc.noaa.gov/products/space-weather-advisory-outlook

ISES (International Space Environment Service):
www.spaceweather.org

UK Met Office:
www.metoffice.gov.uk/public/weather/space-weather

BOM: (Australian Bureau of Meteorology):
www.sws.bom.gov.au/Space_Weather

SANSA (South African National Space Agency):
https://spaceweather.sansa.org.za/products-and-services/forecasts-and-predictions

LAPAN (Indonesian National Institute of Aeronautics and Space):
http://swifts.sains.lapan.go.id

Korean Space Weather Center:
http://spaceweather.rra.go.kr

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