

CHAPTER 8

NATIONAL DATA BUOY CENTER REPORTING STATIONS

8.1. General.

8.1.1. Automated Reporting Stations. The National Data Buoy Center (NDBC) maintains automated reporting stations in the Gulf of Mexico, in the coastal areas *and deep ocean* of the Atlantic and Pacific Oceans, and in the Great Lakes. These data acquisition systems obtain measurements of meteorological and oceanographic parameters for operations and research purposes. Moored buoy station locations and configurations are given in Table 8-1. The locations of Coastal-Marine Automated Network (C-MAN) stations are listed in Table 8-2. Figures 8-1 through 8-3 show the locations of all moored buoys and C-MAN stations. Figure 8-4 is a detailed chart of the network in the Gulf of Mexico and along the southeast U.S. coast. The operational status and measurement capability of stations can be obtained from NDBC *Systems Operations Division, Stennis Space Center, MS 39529-6000*, phone 228-688-1212, or on-line via NDBC's home page on the World Wide Web (www) at <http://www.ndbc.noaa.gov>.

8.1.2. Data Acquisition. Moored buoy and C-MAN stations routinely acquire, store, and transmit data every hour; a few selected stations report *more frequently*. Data obtained operationally include sea-level pressure, wind speed and direction, peak wind, and air temperature. Sea-surface temperature and wave spectra data are measured by all moored buoys and a limited number of C-MAN stations. Relative humidity is also measured at several stations.

8.1.3. Drifting Buoys. *NDBC is capable of acquiring, preparing, and deploying drifting buoys; however, an operational drifting buoy requirement has not been identified or funded. Research interests should contact NDBC directly with drifting buoy requirements.*

8.2. Requests for Drifting Buoy Deployment. *Drifting buoy deployments should be coordinated with the Department of Commerce (DOC), through the National Oceanic and Atmospheric Administration (NOAA). NOAA will initiate a request through the Office of the Federal Coordinator for Meteorology (OFCM). The request for deployment support will then be sent to the 53rd Weather Reconnaissance Squadron (53 WRS) through HQ Air Force Reserve Command (AFRC). Deployments in advance of a U.S. land-threatening hurricane require a 36- to 48-hour notification. All requests will include specific information, regarding onloading base, accompanying technicians, desired pickup times, reimbursement funding, and other pertinent data.*

8.2.1. Tropical Prediction Center/National Hurricane Center (TPC/NHC). TPC/NHC forecasters will issue through the Tropical Cyclone Plan of the Day (TCPOD) an alert or outlook for drifting buoy deployment 48 hours prior to the planned deployment. Hard tasking for the deployment will be issued 14 hours prior to the event via the TCPOD.

Table 8-1. Moored buoy locations and configurations

SITE	STATION ID	LOCATION	HULL SIZE (m)	ANEMOMETER HEIGHT (m)
GULF OF MEXICO	42001	25.9°N 89.7°W	10	10
	42002	25.9°N 93.6°W	10	10
	42003	25.9°N 85.9°W	10	10
	42007 ¹	30.1°N 88.8°W	3	5
	42019 ¹	27.9°N 95.4°W	3	5
	42020 ¹	26.9°N 96.7°W	3	5
	42035 ¹	29.2°N 94.4°W	3	5
	42036 ¹	28.5°N 84.5°W	3	5
	42039 ¹	28.8°N 86.0°W	3	5
	42040 ¹	29.2°N 88.3°W	3	5
	42041	27.2°N 90.6°W	3	5
ATLANTIC OCEAN	41001	34.7°N 72.6°W	6	5
	41002	32.3°N 75.2°W	6	5
	41004 ¹	32.5°N 79.1°W	3	5
	41008	31.4°N 80.9°W	3	5
	41009 ¹	28.5°N 80.2°W	3	5
	41010 ¹	28.9°N 78.5°W	6	5
	44004	38.5°N 70.7°W	6	5
	44005	42.9°N 68.9°W	6	5
	44007 ¹	43.5°N 70.1°W	3	5
	44008	40.5°N 69.4°W	3	5
	44009	38.5°N 74.7°W	3	5
	44011 ¹	41.1°N 66.6°W	6	5
	44013 ¹	42.4°N 70.7°W	3	5
	44014 ¹	36.6°N 74.8°W	3	5
	44025 ¹	40.3°N 73.2°W	3	5
PACIFIC OCEAN (SOUTH OF 45°N)	46002	42.5°N 130.3°W	6	5
	46006	40.8°N 137.5°W	6	5
	46011 ¹	34.9°N 120.9°W	3	5
	46012 ¹	37.4°N 122.7°W	3	5
	46013 ¹	38.2°N 123.3°W	3	5
	46014 ¹	39.2°N 124.0°W	3	5
	46022 ¹	40.8°N 124.5°W	3	5
	46023 ¹	34.7°N 121.0°W	3	5
	46025 ¹	33.8°N 119.1°W	3	5
	46026 ¹	37.8°N 122.8°W	3	5
	46027 ¹	41.9°N 124.4°W	3	5
	46028 ¹	35.7°N 121.9°W	3	5
	46029	46.1°N 124.5°W	3	5
	46030 ¹	40.4°N 124.5°W	3	5
	46042 ¹	36.8°N 122.4°W	3	5
	46047	32.4°N 119.5°W	3	5
	46050 ¹	44.6°N 124.5°W	3	5
	46053 ¹	34.2°N 119.8°W	3	5
	46054 ¹	34.3°N 120.4°W	10	10
	46059 ¹	38.0°N 130.0°W	6	5
	46062 ¹	35.1°N 121.0°W	10	10
46063 ¹	34.3°N 120.7°W	6	5	
51001	23.4°N 162.3°W	6	6	
51002	17.2°N 157.8°W	6	6	
51003	19.2°N 160.7°W	6	6	
51004	17.4°N 152.5°W	6	5	
51028 ¹	0.0°N 153.9°W	3	5	

¹Temporary site established with other special funding.

Table 8-2. C-MAN sites

SITE	STATION ID	LOCATION	STATION NAME
GULF OF MEXICO	BURL1	28.9°N 89.4°W	Southwest Pass, LA
	CDRF1 ¹	29.1°N 83.0°W	Cedar Key, FL
	CSBF1	29.7°N 85.4°W	Cape San Blas, FL
	DPIA1	30.3°N 88.1°W	Dauphin Island, AL
	DRYF1 ¹	24.6°N 82.9°W	Dry Tortugas, FL
	GDIL1	29.3°N 90.0°W	Grand Isle, LA
	KTNF1 ¹	29.8°N 83.6°W	Keaton Beach, FL
	LONF1 ¹	24.8°N 80.9°W	Long Key, FL
	PTAT2	27.8°N 97.1°W	Port Aransas, TX
	SRST2	29.7°N 94.1°W	Sabine, TX
	VENF1	27.1°N 82.4°W	Venice, FL
ATLANTIC OCEAN	ALSN6	40.5°N 73.8°W	Ambrose Light, NY
	BUZM3	41.4°N 71.0°W	Buzzards Bay, MA
	CHLV2	36.9°N 75.7°W	Chesapeake Light, VA
	CLKN7	34.6°N 76.5°W	Cape Lookout, NC
	DSL7	35.2°N 75.3°W	Diamond Shoals, NC
	DUCN7	36.2°N 75.8°W	Duck Pier, NC
	FBIS1	32.7°N 79.9°W	Folly Island, SC
	FPSN7	33.5°N 77.6°W	Frying Pan Shoals, NC
	FWYF1 ¹	25.6°N 80.1°W	Fowey Rocks, FL
	IOSN3	43.0°N 70.6°W	Isle of Shoals, NH
	LKWF1	26.6°N 80.0°W	Lake Worth, FL
	MDRM1	44.0°N 68.1°W	Mt. Desert Rock, ME
	MISM1	43.8°N 68.9°W	Matinicus Rock, ME
	MLRF1	25.0°N 80.4°W	Molasses Reef, FL
	SANF1 ¹	24.5°N 81.9°W	Sand Key, FL
	SAUF1	29.9°N 81.3°W	St. Augustine, FL
	SMKF1	24.6°N 81.1°W	Sombrero Key, FL
	SPGF1	26.7°N 79.0°W	Settlement Point, GBI
TPLM2	38.9°N 76.4°W	Thomas Point, MD	
EASTERN PACIFIC OCEAN (SOUTH OF 45°N)	CARO3	43.3°N 124.4°W	Cape Arago, OR
	NWPO3	44.6°N 124.1°W	Newport, OR
	PTAC1	39.0°N 123.7°W	Point Arena, CA
	PTGC1	34.6°N 120.6°W	Point Arguello, CA

¹Temporary site established with other special funding.

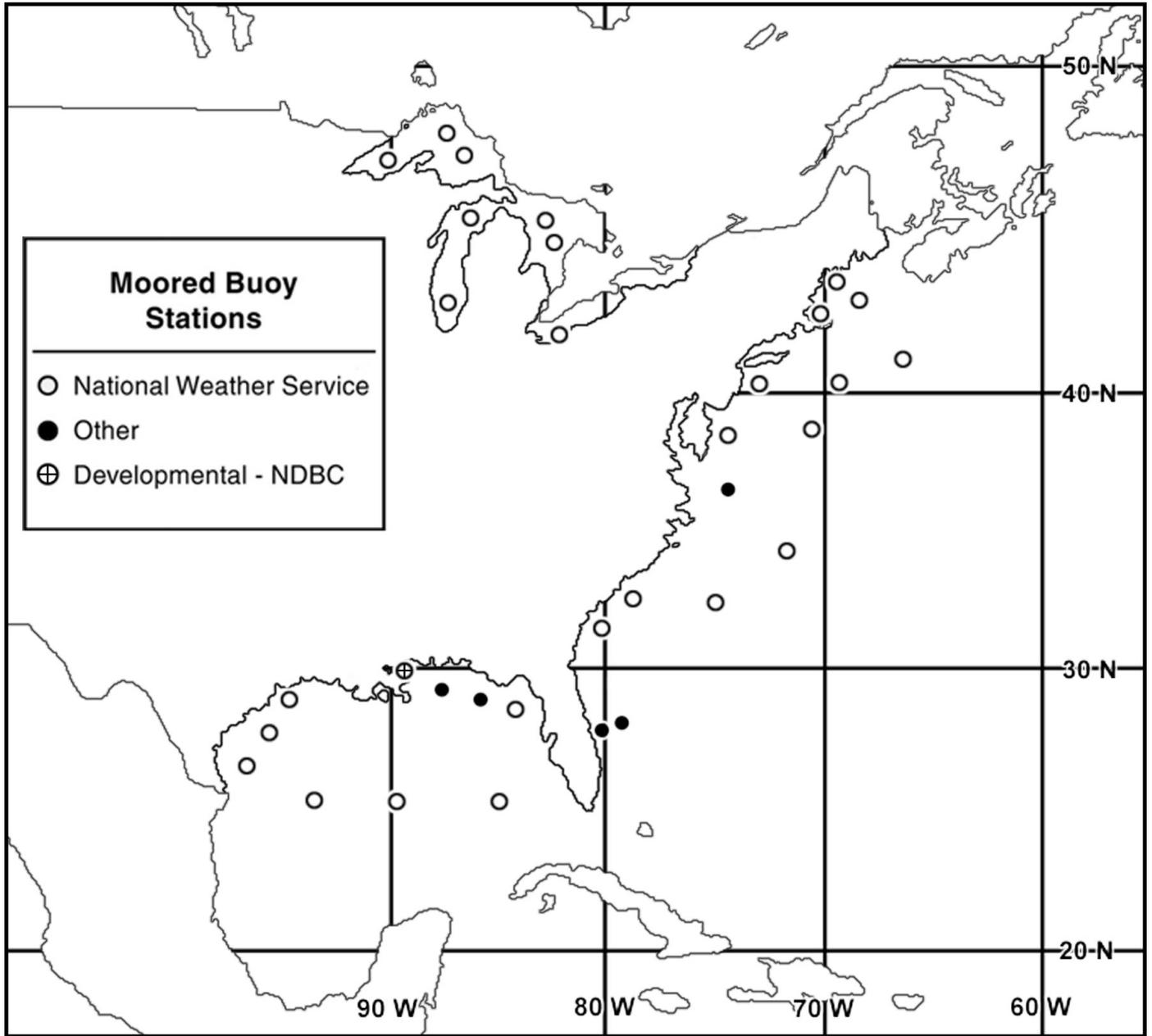


Figure 8-1. NDBC moored buoy locations in the Atlantic Ocean, the Gulf of Mexico, and the Great Lakes

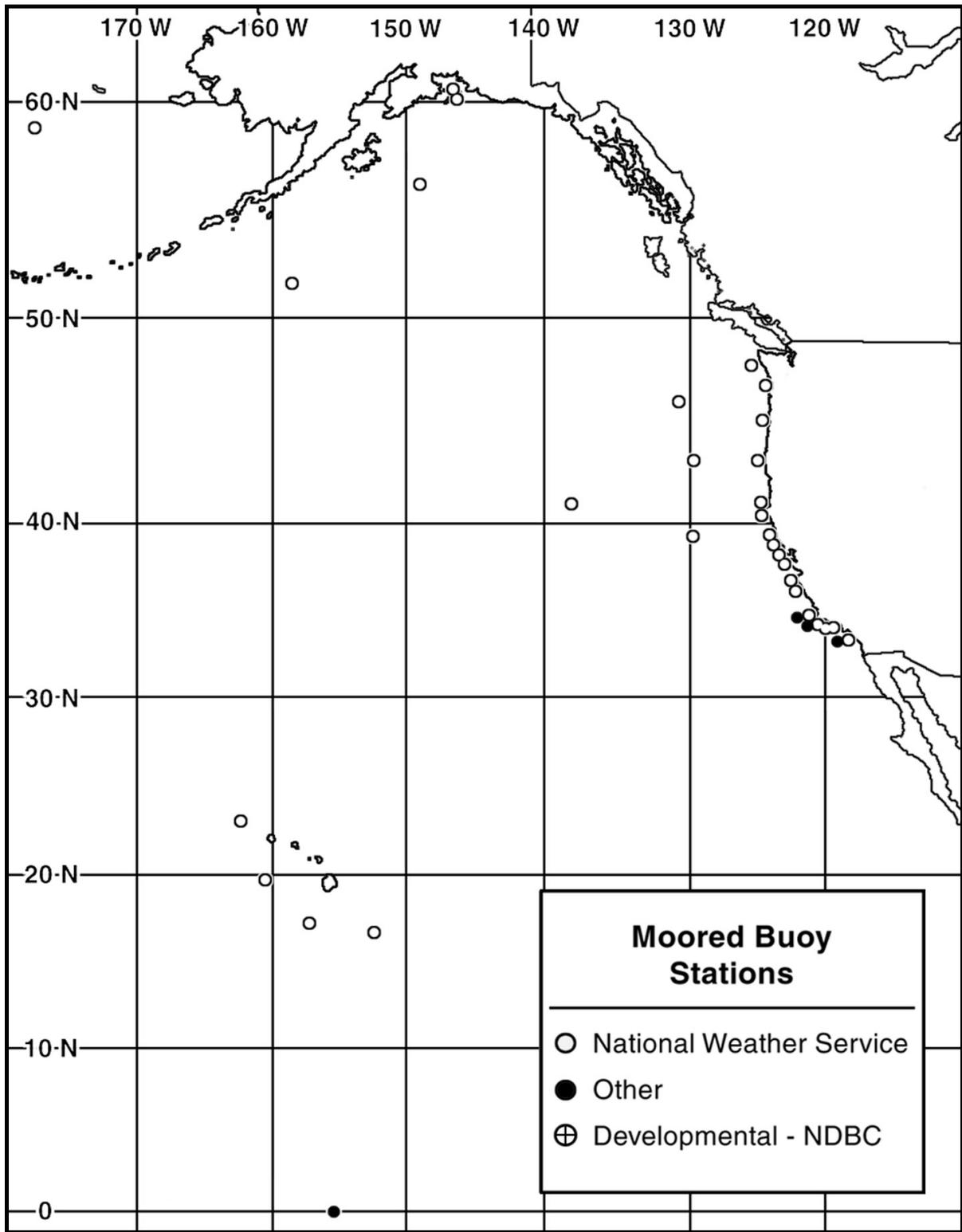


Figure 8-2. NDBC moored buoys in the Pacific Ocean

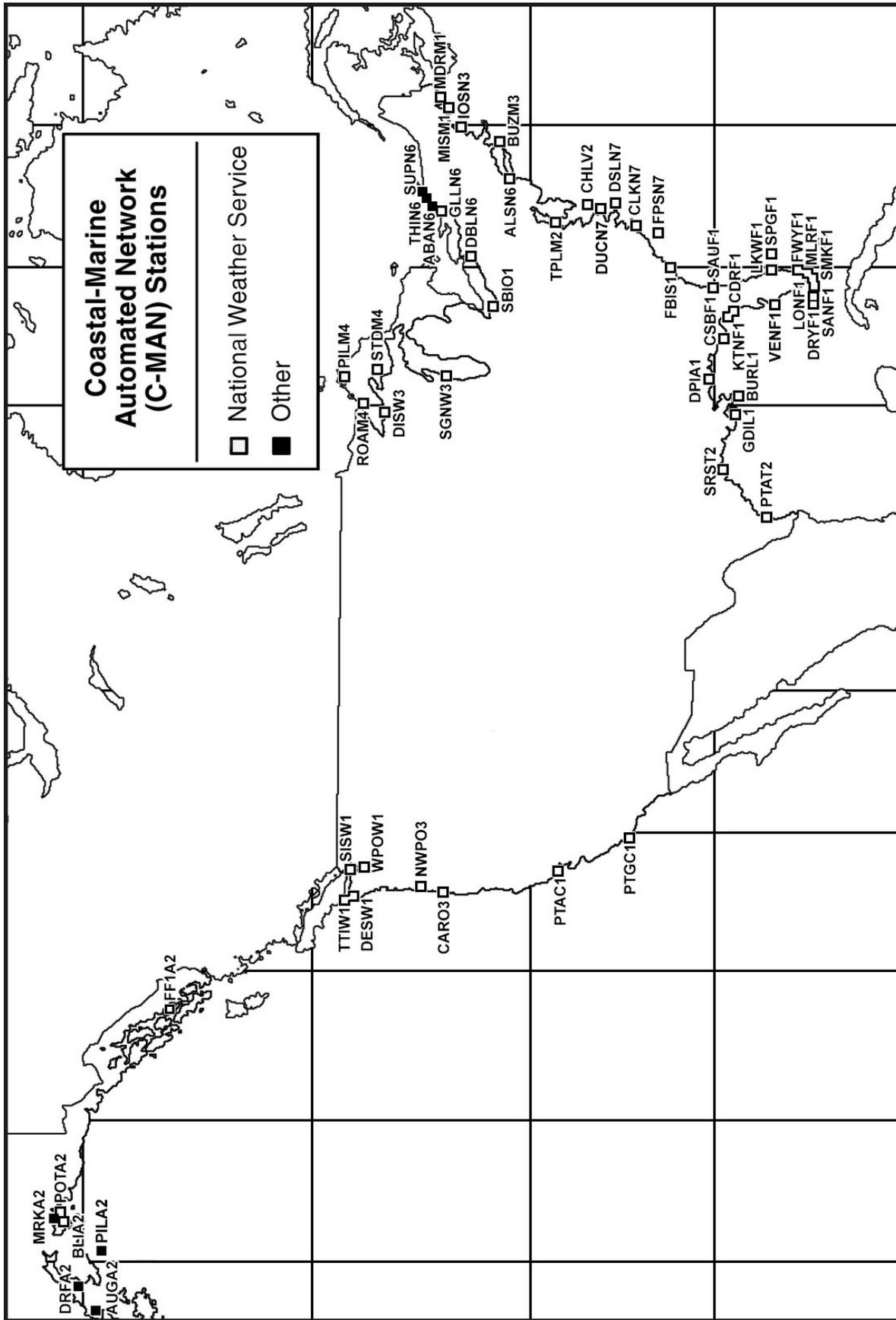


Figure 8-3. C-MAN stations in the coastal U.S.

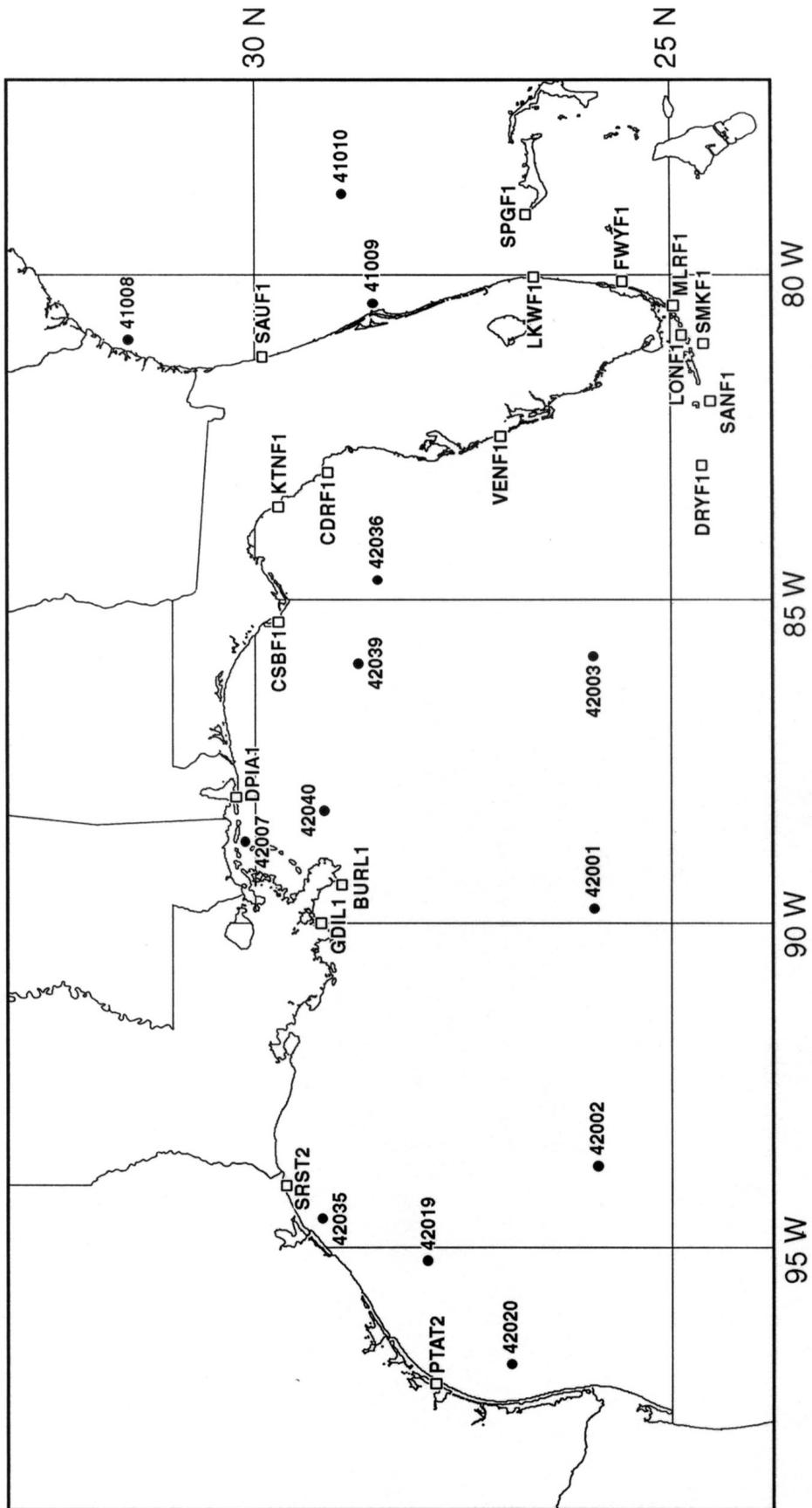


Figure 8-4. NDBC planned and current Gulf of Mexico moored buoy network

8.2.2. Deployment Buoys. DOC may request the deployment of up to four drifting buoys between 185 and 333 km (100 and 180 nm) from the storm center, depending on the dynamics of the storm system. DOC will ensure the buoys and mission-related DOC personnel are available for pickup by AFRC aircraft. The specific DOC request for placement of the buoys will depend on several factors, including:

- Characteristics of the storm, including size, intensity, and velocity.
- Storm position relative to the coast and population centers.

8.2.3. Deployment Position. The final deployment position will be provided before the flight crew briefing. Two examples of possible buoy deployment patterns are shown in Figure 8-5.

8.3. Communications. Moored buoy and C-MAN data are transmitted via the Geostationary Operational Environmental Satellite (GOES) to the National Environmental Satellite, Data, and Information Service (NESDIS) and then are relayed to the NWS Telecommunications Gateway (NWSTG) for processing and dissemination. Moored buoy observations are formatted into the World Meteorological Organization (WMO) FM 13-IX SHIP code. The SHIP code is defined in Federal Meteorological Handbook No. 2, Surface Synoptic Codes. C-MAN measurements are formatted into C-MAN code, which is very similar to the WMO FM 12-IX SYNOP code. Code forms are shown in Table 8-3. The C-MAN code is contained in the C-MAN Users' Guide, which is available from NDBC. Drifting buoy data are sent through NOAA's polar-orbiting environmental satellites (POES) to the U.S. Argos Global Processing Center, Largo, MD. Service Argos processes and formats the data into the WMO FM 18 BUOY code defined in the WMO *Manual on Codes*, Volume I. The messages are then routed to the NWSTG for distribution.

Figure 8-5. Drifting data buoy deployment patterns

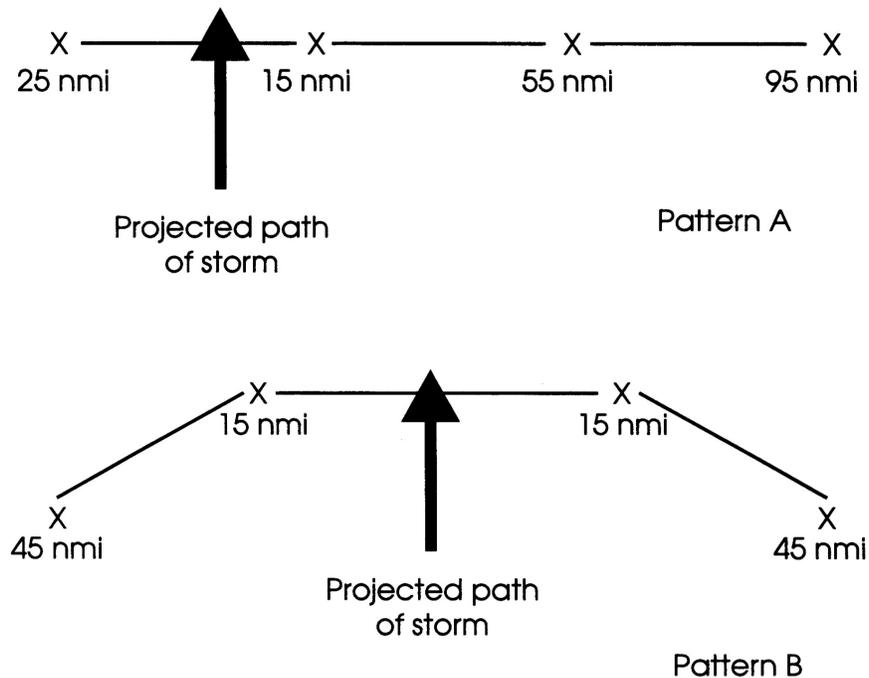


Table 8-3. Code forms for moored data buoys, C-MAN stations, and drifting buoys

FORM	CODE
FM 13-IX (SHIP) REPORT OF SYNOPTIC SURFACE OBSERVATION FROM A SEA STATION (AUTOMATIC WEATHER STATION)	<p>M_rM_iM_jM_k A₁b_wn_bn_bn_b YYGGi_w 99L_aL_aL_a Q_cL_oL_oL_oL_o</p> <p>i_ri_x// /ddff 1s_nTTT (2s_nT_dT_dT_d) 4PPPP 5appp 9GGgg</p> <p>22200 Q_sT_wT_wT_w 1P_{wa}P_{wa}H_{wa}H_{wa} 70 H_{wa}H_{wa}H_{wa} 8s_wT_bT_bT_b</p> <p>333 912ff (00fff)</p> <p>555 11fff 22fff (3GGgg 4ddf_mf_m)</p> <p>(6G_cG_cg_cg_c d₁d₁d₁f₁f₁f₁ d₆d₆d₆f₆f₆f₆ d₂d₂d₂f₂f₂f₂ d₃d₃d₃f₃f₃f₃ d₄d₄d₄f₄f₄f₄ d₅d₅d₅f₅f₅f₅)</p>
U.S. NATIONAL (C-MAN LAND STATION) MODIFIED FM 12-IX	<p>CMAN YYGGi_w</p> <p>XXXXn_i i_ri_xhVV Nddff (00fff) 1s_nTTT 2s_nT_dT_dT_d 4PPPP 5appp 6RRRt_r 9GGgg</p> <p>222// 0s_nT_wT_wT_w 1_{wa}P_{wa}P_{wa}H_{wa}H_{wa} 70H_{wa}H_{wa}H_{wa}</p> <p>333 912ff (00fff)</p> <p>444 1P_{av}P_{av}P_{av}/</p> <p>555 11fff 22fff (3GGgg) (4ddf_mf_mf_m)</p> <p>(6G_cG_cg_cg_c d₁d₁d₁f₁f₁f₁ d₆d₆d₆f₆f₆f₆ d₂d₂d₂f₂f₂f₂ (TIDE1111) d₃d₃d₃f₃f₃f₃ d₄d₄d₄f₄f₄f₄ d₅d₅d₅f₅f₅f₅)</p>
FM 18 BUOY REPORT OF A DRIFTING BUOY OBSERVATION	<p>Section 0: <u>ZZYY</u> Q_cL_aL_aL_aL_aL_a A₁b_wn_bn_bn_b L₀L₀L₀L₀L₀ YYMMJ (6Q₁Q₁//) GGggi_w</p> <p>Section 1: <u>111</u>Q_dQ_x <u>Q</u>ddff ((2s_nT_dT_dT_d) (3P_oP_oP_o) or (1s_nTTT) (29UUU)) (4PPPP) (5appp)</p> <p>Section 2: <u>222</u>Q_dQ_x (0S_nT_wT_wT_w) (20P_{wa}P_{wa}P_{wa}) (1P_{wa}P_{wa}H_{wa}H_{wa}) (21H_{wa}H_{wa}H_{wa})</p> <p>Section 3: <u>333</u>Q_{d1}Q_{d2} (8887k₂ 2z₀z₀z₀z₀ 3T₀T₀T₀T₀ 4S₀S₀S₀S</p> <p style="text-align: center;">..... 2z_nz_nz_nz_n 3T_nT_nT_nT_n 4S_nS_nS_nS_n) (66k₆9k₃ 2z₀z₀z₀z₀ d₀d₀c₀c₀c₀</p> <p style="text-align: center;">..... 2z_nz_nz_nz_n d_nd_nc_nc_nc_n)</p> <p>Section 4: <u>444</u> ((Q_cL_aL_aL_aL_aL_a (ZV_BV_Bd_Bd_B) (1Q_pQ₂Q_{tw}Q₄) L₀L₀L₀L₀L₀) (8V_iV_iV_iV_i) or (2Q_nQ₁//) (YYMMJ GGggL)) (9i_dZ_dZ_dZ_dZ_d)</p>