# MARINE WEATHER REVIEW – NORTH ATLANTIC AREA
# May through August 2002

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## Introduction

With the progression of the season into summer the main track of low-pressure systems shifted north, from the Canadian Maritime Provinces northeast toward Iceland with several turning north into the Davis Strait. Although cyclonic activity is normally in decline with summer approaching, the period from the middle of May through the middle of June was especially active, with several lows developing storm force winds to 60 kt to the west of Great Britain. Also, June 1 marks the start of the Atlantic hurricane season. Two named tropical cyclones affected MPC's waters north of 31N, including the first of the season in mid-July and the third named storm in early August.

## Tropical Activity

**Tropical Storm Arthur:** Arthur, the first tropical cyclone of the 2002 Atlantic hurricane season, originated as a weak low in the Gulf of Mexico on July 9, then emerged off the South Carolina coast early on July 14 and became Tropical Depression 1 at 1800 UTC July 14 with maximum sustained winds of 30 kt with gusts to 40 kt. The system tracked east just south of a stationary front and intensified to a tropical storm eighteen hours later. Figure 1 shows Arthur with a maximum intensity of 50 kt with gusts to 60 kt about to merge with the front to the northwest and becoming an extratropical storm. The ship **LAFQ5** near 36N 64W

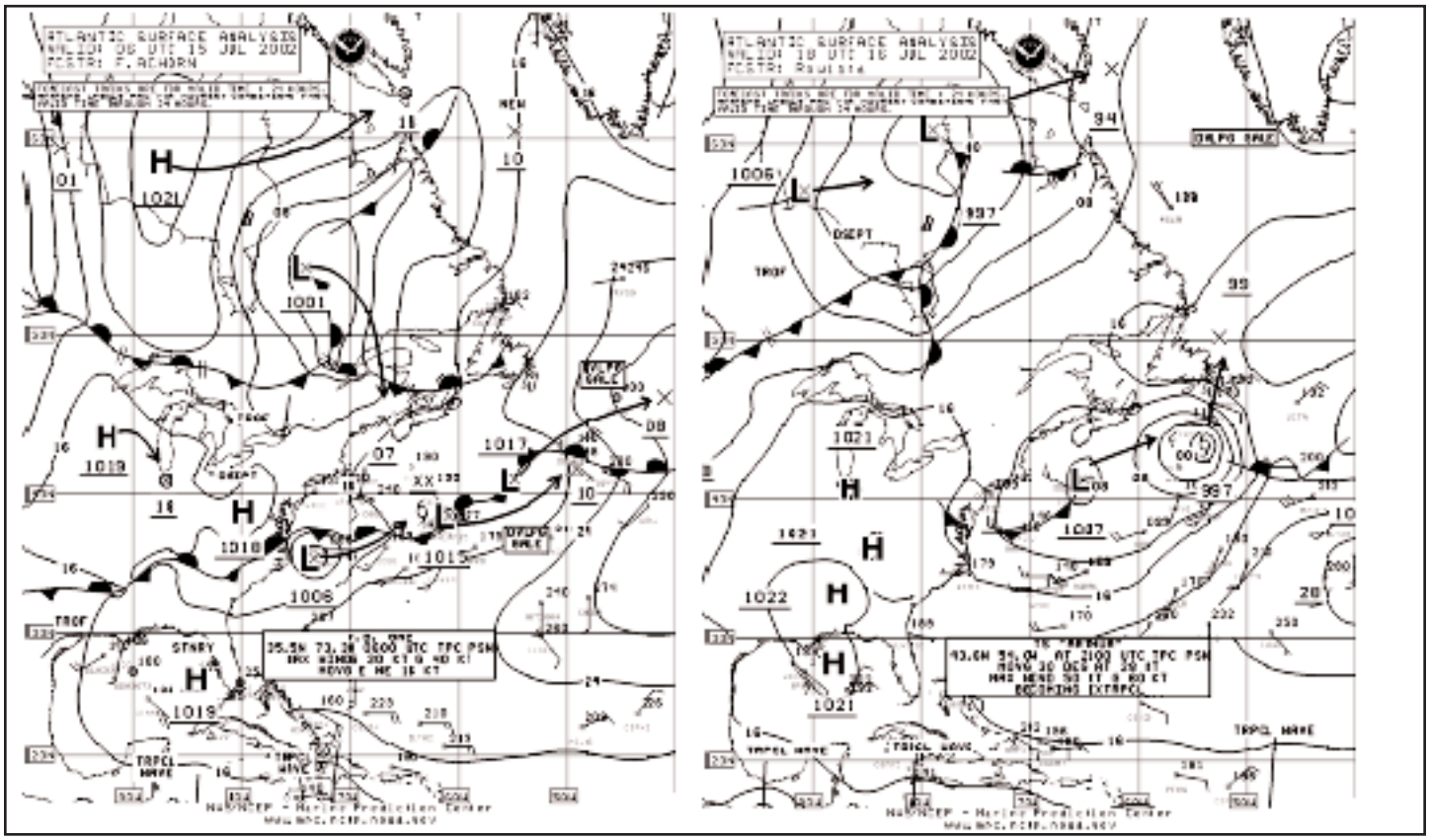

**Figure 1. MPC North Atlantic Surface Analysis charts (Part 2 - west) showing development of Tropical Storm Arthur. Valid times are 0600 UTC July 15 and 1800 UTC July 16, 2002.**

encountered south winds of 45 kt and 5.5-meter seas (18 feet) at 0000 UTC July 16. Later, at 1800 UTC July 16, the **Choyang Zenith** (DACP) experienced southwest winds of 35 kt and 8.5-meter seas (28 feet) near 40N 53W, following passage of Arthur's center. The Canadian buoy 44141 (42.1N 56.2W) reported a northeast wind at 39 kt with gusts to 52 kt, 3.5-meter seas (11 feet) and a pressure of 997.5 mb at 1500 UTC July 16. Figure 2 is a GOES8 infrared satellite image of Arthur near maximum intensity, revealing a central dense core of cloudcover around the center, a characteristic of tropical cyclones. The remains of Arthur then moved north into the Davis Strait as a gale-force low early on July 19.

**Tropical Storm Cristobal:** The third tropical cyclone of the season began as a weak non-frontal low near the South Carolina coast early on August 4 which drifted southeast, becoming Tropical Depression 3 near 32N 77W at 2100 UTC August 5. It was named Tropical Storm Cristobal by TPC at 0900 UTC August 7 just south of MPC's waters near 29.5N 76.2W with maximum sustained winds of 40 kt with gusts to 50 kt. The system was subsequently picked up by an approaching cold front and maintained the same intensity, re-entering MPC's waters near 31.5N 76.0W at 2100 UTC August 8 before becoming extratropical. The **Figaro** (S6PI) reported a southwest wind of 35 kt near 38N 57W at 1200 UTC August 9 as the center passed to the west. Twenty-four hours later, the **Ever Reward** (3FYB3) reported 5-meter seas (16 feet) near 45N 45W, along with south winds of 30 kt.

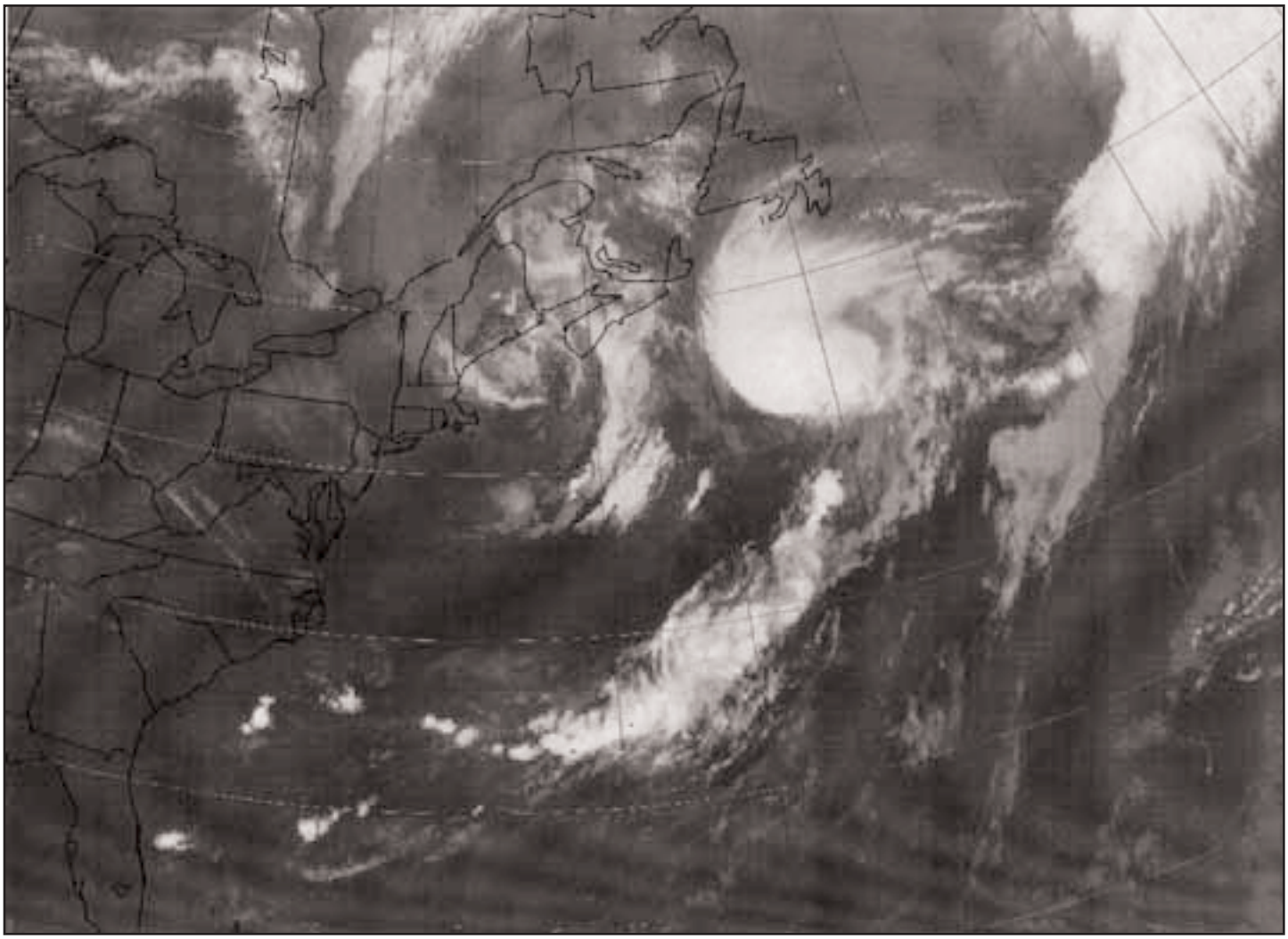

**Figure 2. GOES-8 infrared satellite image valid 1145 UTC July 16, 2002. Satellite senses temperature on a scale from warm (black) to cold (white) in this type of image. The valid time is about 6 hours prior to that of the second part of Figure 1.**

The remnants of Cristobal then moved northeast past Iceland early on August 14 as a gale-force low.

## Other Significant Events of the Period

**Western North Atlantic Storm of 4-6 May:** Figure 3 shows a low-pressure center moving off the New England coast and intensifying over a 36-hour period to become the 972-mb storm (at maximum intensity), northeast of Newfoundland in the second part of the figure. This was the most intense low (in terms of central pressure) in the western North Atlantic during this four-month period. At 1200 UTC May 4, the **Maersk Wind** (S6TY) reported south winds of 50 kt and 6.5-meter seas (21 feet) near 44N 43W, while the **Alligator Reliance** (ZCBN5) encountered southwest winds of 45 kt and 8.5-meter seas (28 feet) near 46N 43W, the highest seas reported in this storm. Six hours later, the **Kometik** (VCRT) reported southwest winds of 50 kt and 4.5-meter seas (15 feet) at 46N 48W, followed by southwest winds of 40 kt and 8.5-meter seas (28 feet) at 0000 UTC May 5 when the ship was at 47N 48W. This system subsequently lifted northeast and weakened, passing northwest of Iceland late on May 6.

**Eastern North Atlantic Storm of 15-16 May:** Like the mid-June event to be described below, this storm originated as a secondary development on the southeast side of a parent gale-force low in the central North Atlantic. A 998-mb low formed near 45N 27W at 0000 UTC May 15 and absorbed the parent low to the northwest in the following twenty-four hours while intensifying to 982 mb. The maximum intensity was reached at 0600 UTC May 16 (980 mb) when the center was at 49N 22W. Although not as intense as the mid-June storm and with no ships reporting storm-force winds, reported seas were as high as 11.5 meters (37 feet) from the **Sea-Land Developer** (KHRH) near 45N 24W at 0000 UTC May 16. Reported winds from this ship were southwest 45 kt. This system subsequently began a slow weakening trend while drifting north, then northwest, before merging with a gale coming off the Canadian coast on May 18.

**North Atlantic Storm of 19-21 May:** This storm, unseasonably strong for late May, originated near the mid-Atlantic coast of the U.S. early on May 18 and followed a northeastward track. Figure 4 depicts the period of most rapid deepening of this system,

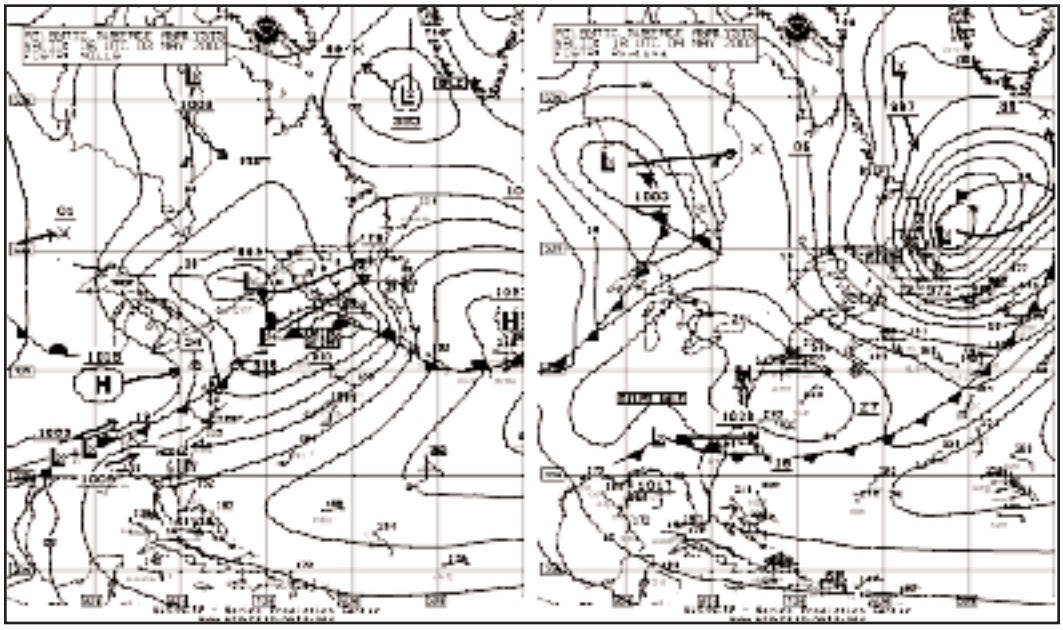

**Figure 3. MPC North Atlantic Surface Analysis charts (Part 2) valid 0600 UTC May 3 and 1800 UTC May 4, 2002.**

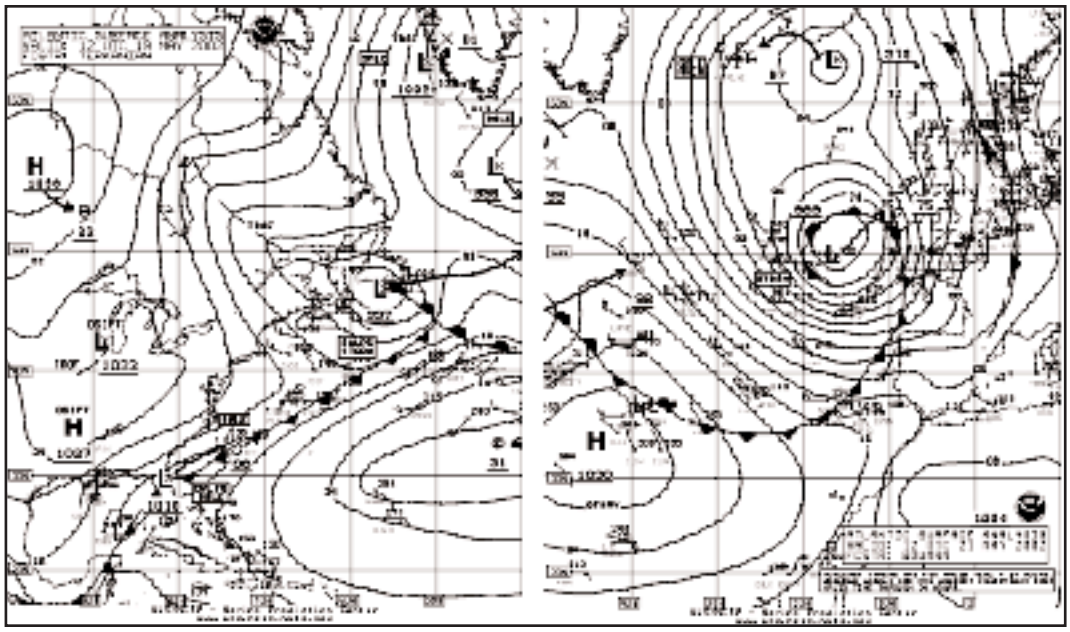

**Figure 4. MPC North Atlantic Surface Analysis charts: A Part 2 (west) panel valid 1200 UTC May 19 and a Part 1 (east) panel valid 1200 UTC May 21, 2002.**

with the central pressure dropping 28 mb over a 48-hour period. The system is shown near maximum intensity at 969-mb central pressure just west of the British Isles in the second part of Figure 4. Six hours prior to this time, the central pressure was 968 mb, equal to the lowest pressure in the mid-June storm and the most intense (among non-tropical lows) of the May-August period in both the North Atlantic and North Pacific. This system became a storm by 1200 UTC May 20 near 50N 40W, when the vessel **LAFQ5** (47N 36W) reported west winds of 50 kt and 6-meter seas (20 feet). Six hours later, the same ship encountered northwest winds of 60 kt and 8-meter seas (27 feet) near 47N 38W. At 0000 UTC May 21, the **Queen Elizabeth 2** (GBTT) experienced northwest winds of 55 kt and 6-meter seas (19 feet) near 47N 31W. At 1200 UTC May 21 the **Atlantic Cartier** (C6MS4) reported from near 48N 21W with northwest winds of 60 kt and 11.5-meter seas (38 feet), the highest wind and sea conditions reported in this storm. The first part of Figure 5 shows this system weakening early on the May 22 while passing just west of Ireland, and heading toward Iceland.

**Northeastern Atlantic Storm of 22-24 May:** This storm followed closely behind the aforementioned intense low and originated near the north Florida coast as a gale-force low at 1200 UTC May 19. Figure 5 shows the period of most rapid development over the 36-hour period ending at 1800 UTC May 23 when the central pressure dropped 30 mb. The central pressure bottomed out at 972 mb six hours later, at 0000 UTC May 24. MPC analyzed this system as a hurricane-force storm (maximum winds of at least 64 kt) at 1800 UTC May 23 (second part of Figure 5). A QuikScat image taken at about that time (Figure 6) shows the stronger winds occurring south and southwest of the center, with three 60-kt wind barbs apparent near 51N 20W. Available conventional surface reports were

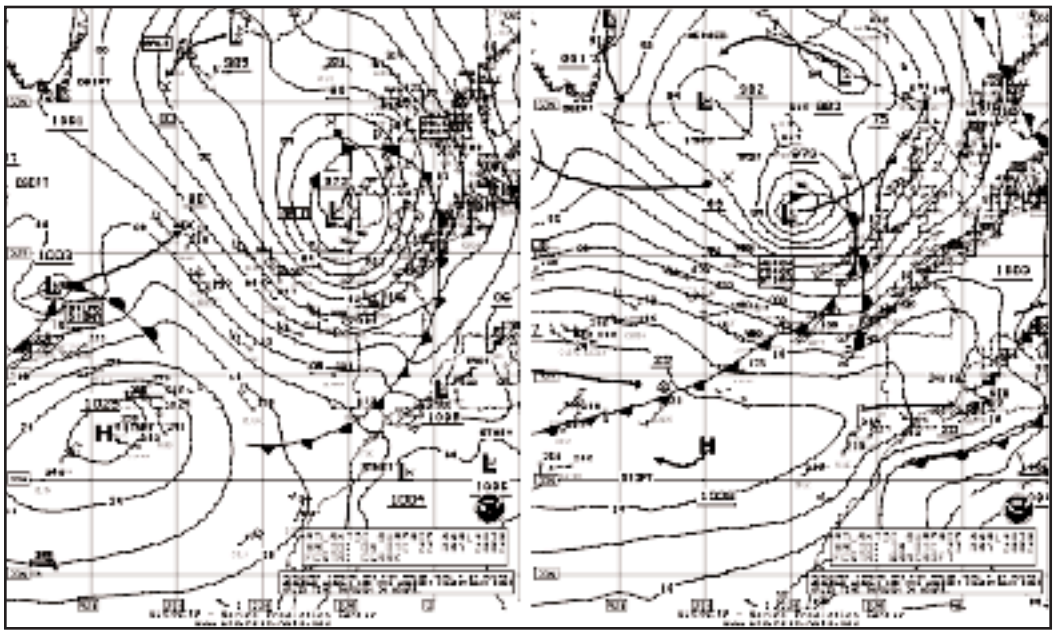

**Figure 5. MPC North Atlantic Surface Analysis charts (Part 1) valid 0600 UTC May 22 and 1800 UTC May 23, 2002.**

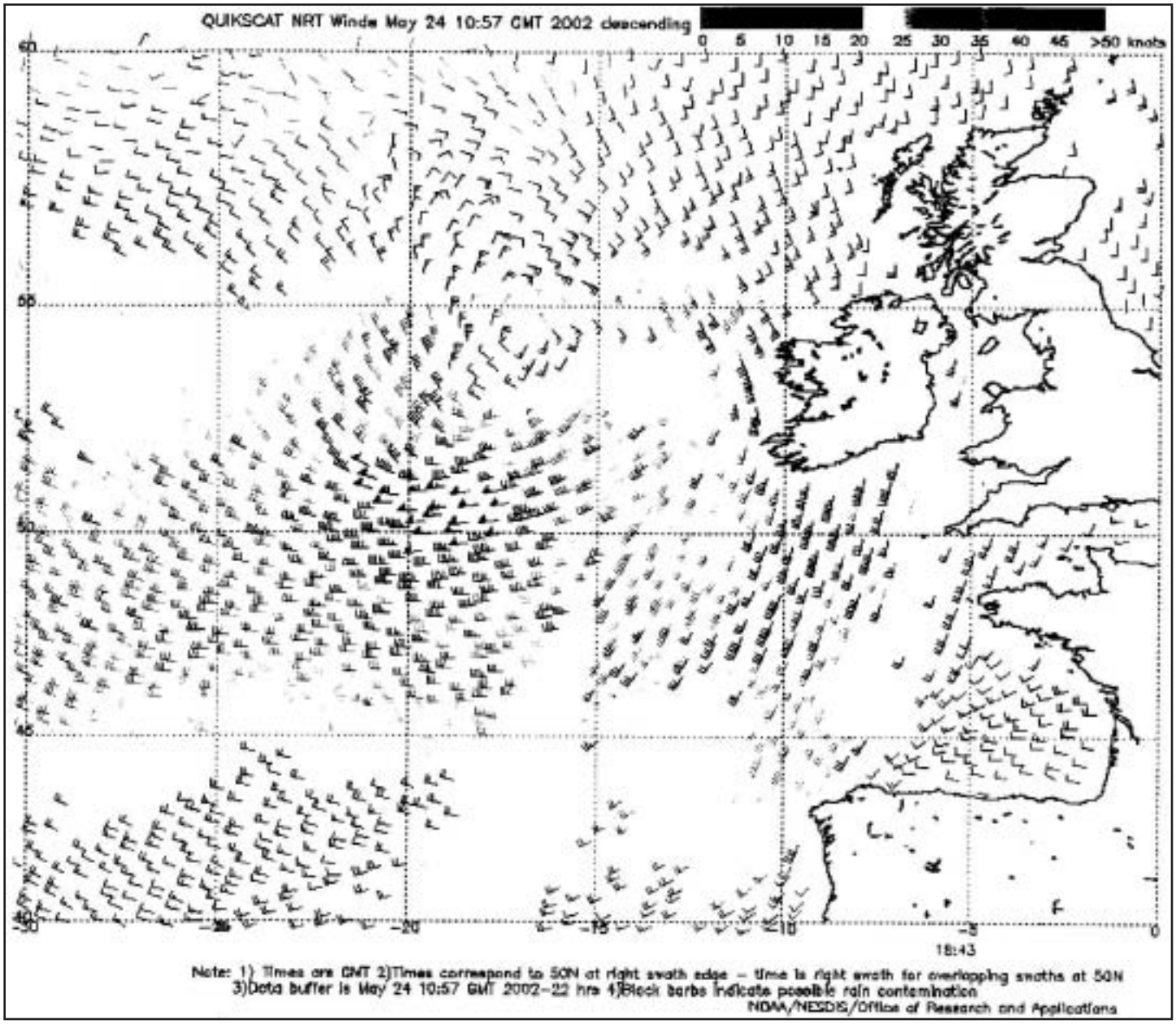


**Figure 6. QuikScat scatterineter unage if satekkute-sensed winds valid 1843 UTC May 23, 2002, or approximately the valid time of the second part of Figure 5.**
*(Image courtesy of NOAA/NESDIS/Office of Research and Applications)*

outside the area of strongest winds. The **Bonn Express** (DGNB) reported the highest wind (a west wind of 45 kt) near 53N 17W at 0600 UTC May 24, a time when the system was beginning to weaken. The **Alligator Reliance** (ZCBN5) sent three reports of seas 9 meters (30 feet) or higher from 1200 UTC May 23 to 0000 UTC May 24, with the highest being 10 meters (33 feet) at 0000 UTC May 24 near 47N 30W (accompanied by a west wind of 30 kt). The system subsequently weakened and became stationary just northwest of Great Britain, where it dissipated on May 26.

**Northeastern Atlantic Storm of 8-9 June:** This developing storm took a more west-to-east track than preceding systems mentioned above, emerging off the southern Labrador coast at 0000 UTC June 7. Figure 7

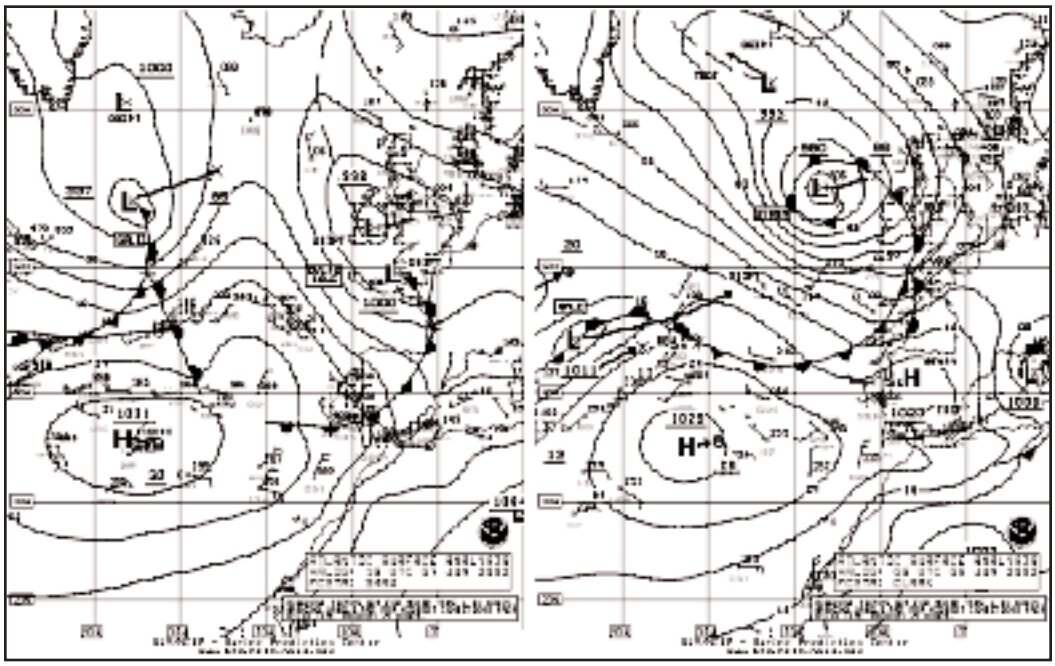

**Figure 7. MPC North Atlantic Surface Analysis charts (Part 1) valid 1800 UTC June 7 and 0600 UTC June 9, 2002.**

shows this system eighteen hours later, and 36 hours afterwards when the storm was at maximum intensity (980 mb) just west of the British Isles. The ship **ZCBP5** (50N 28W) reported a west wind of 45 kt and 10-meter seas (33 feet) at 1800 UTC June 8. At 0600 UTC June 9, the **Atlantic Cartier** (C6MS4) encountered southwest winds of 50 kt and 5-meter seas (16 feet) near 50N 17W. The high-resolution QuikScat image of Figure 8 valid at this time shows a large area of gale-force or higher winds on the south and southwest sides of the center with some 50-kt flags mixed in. Twelve hours later, the buoy 62029 (48N 12W) reported seas of 7.5 meters (25 feet). This system subsequently turned toward the northeast and weakened northwest of the British Isles on June 10.

**Northeastern Atlantic Storm of 15-16 June:** This storm developed from a secondary low passing to the southeast of a parent low (Figure 9) in a manner similar to that described in the 15-16 May event. The most rapid period of intensification was the 24-hour period ending at 1800 UTC June 16, when the central pressure dropped 26 mb. The 500-mb analysis (Figure 10) is for 1200 UTC June 16, within this period of rapid development. A short-wave trough and associated jet stream rounding the base of a larger-scale trough support development.

The second part of Figure 9 shows the storm at maximum intensity (968 mb). Along with the 19-21 May storm, this low was the most intense of the four-month period in both oceans, for non-tropical (or extratropical lows). The system in its intense phase passed through an area of sparse ship and buoy data, but a QuikScat pass (Figure 11) shows an area of winds to 60 kt northwest of Ireland about 6 hours prior to the time of the second part of Figure 9. The highest wind reported by ships was 45 kt, from the southwest as reported by the **Naparima (**3FMM6) near 40N 26W at 0600 UTC June 16, and southerly from the **Happy Buccaneer** (PEND) near 52N 11W at 0000 UTC June 17. The **Discovery** (GLNE) reported the highest seas, 10.5 meters (34 feet) along with a south wind of 35 kt, near 64N 5W at 0600 UTC June 18. The buoy 64045 (59N 11W) reported a south wind of 30 kt and 9-meter seas (29 feet) at 1800 UTC June 17. The storm then weakened while moving north, passing east of Iceland late on June 19.

**Northeastern Atlantic Cyclonic Activity, 12-19 August:** A weak low-pessure center passed east of the island of Newfoundland on August 12 and tracked east-northeast before turning more north while intensifying. The system reached a maximum intensity of 988 mb just west of Ireland near 57N 14W at 0000 UTC

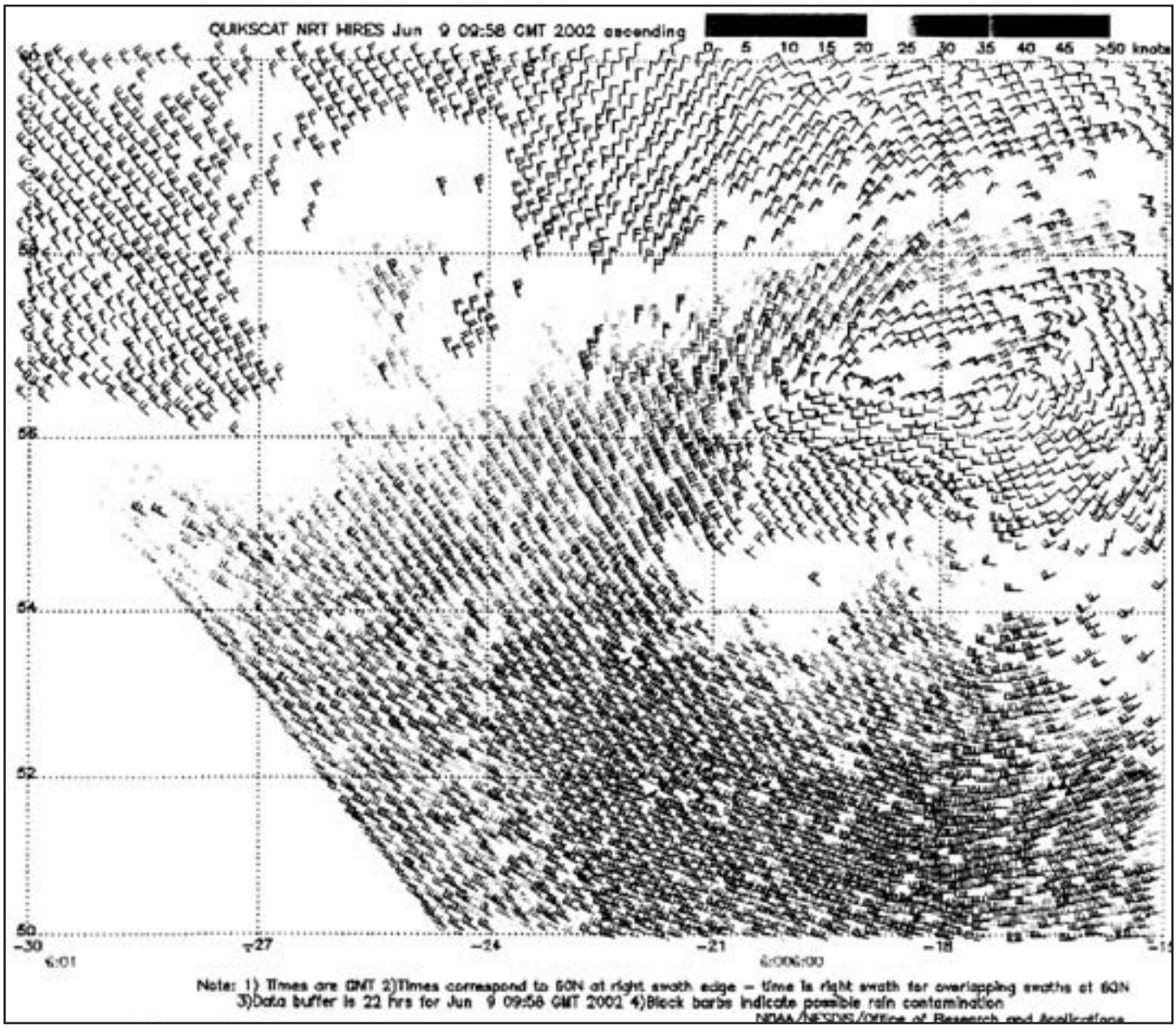


**Figure 8. High-resolution QuikScat scatterometer image of satellite-sensed winds valid 0600 UTC June 9, 2002. The resolution is 12.5 km, versus 25 km in regular QuikScat imagery (Figure 6). Wind barbs of 40 kt or higher stand out in this black-and-white reproduction of the original colored image.**
*(Image courtesy of NOAA/NESCDIS/Office of Research and Application)*

August 15, when MPC classified it as a storm at that time and for the following six hours. Ship data was lacking, with the **Norrona** (OZ2000) reporting a southwest wind of 40 kt near 63N 9W at 0000 UTC August 16 as the system was passing just east of Iceland. The low-pressure system which followed originated in the central North Atlantic and attained a similar intensity, 985 mb, near 55N 14W at 1200 UTC August 17 before lifting north and weakening near Iceland on August 19. A ship with callsign **VRVQ9** near 51N 13W encountered south winds of 45 kt at 0000 UTC August 17, with a nearby buoy reporting 5-meter seas (17 feet). The buoy 62106 (56N 10W) reported south winds of 35 kt and 7.5-meter seas (25 feet) at 1800 UTC August 17.

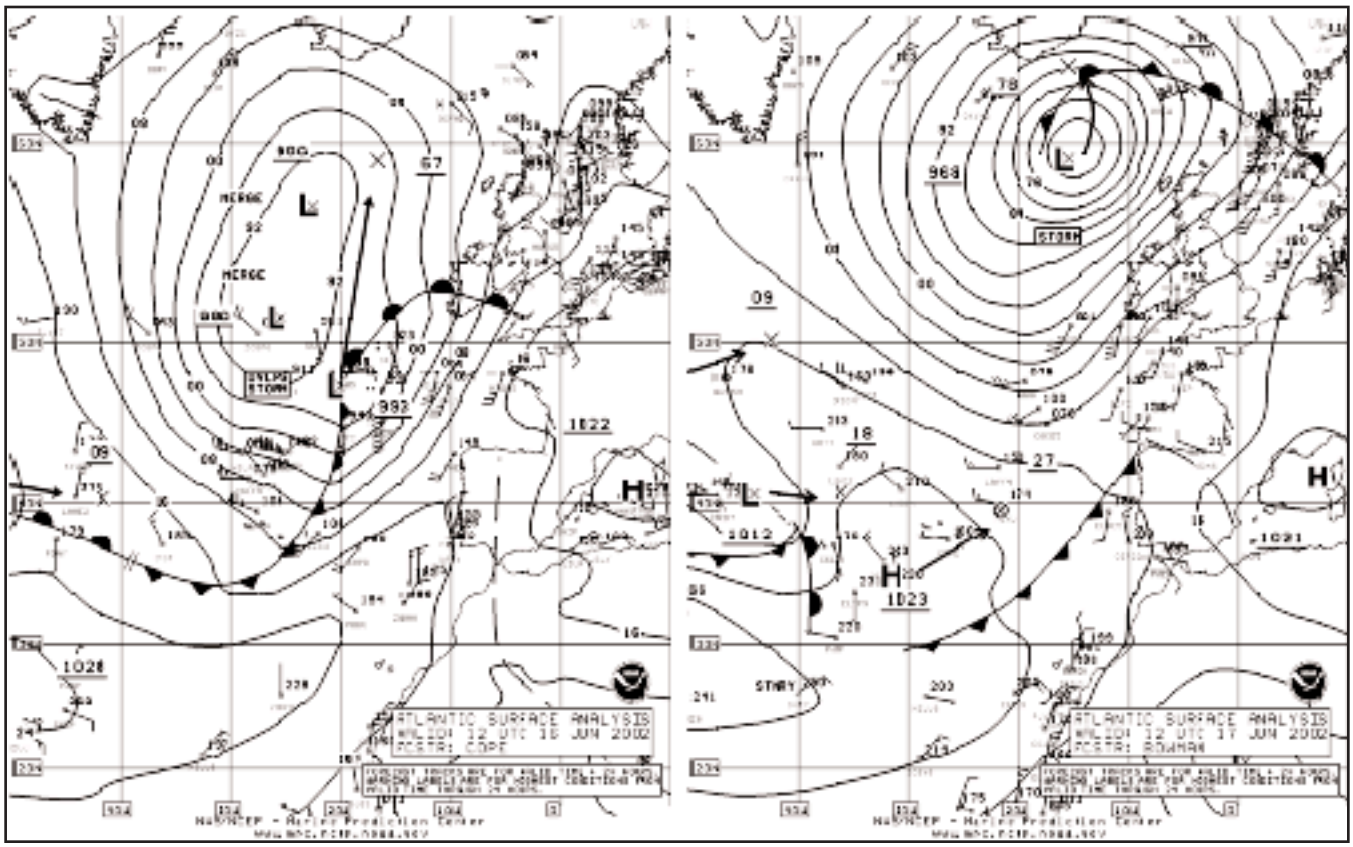


**Figure 9. MPC North Atlantic Surface Analysis charts (Part 1) valid 1200 UTC June 16 and 17, 2002.**

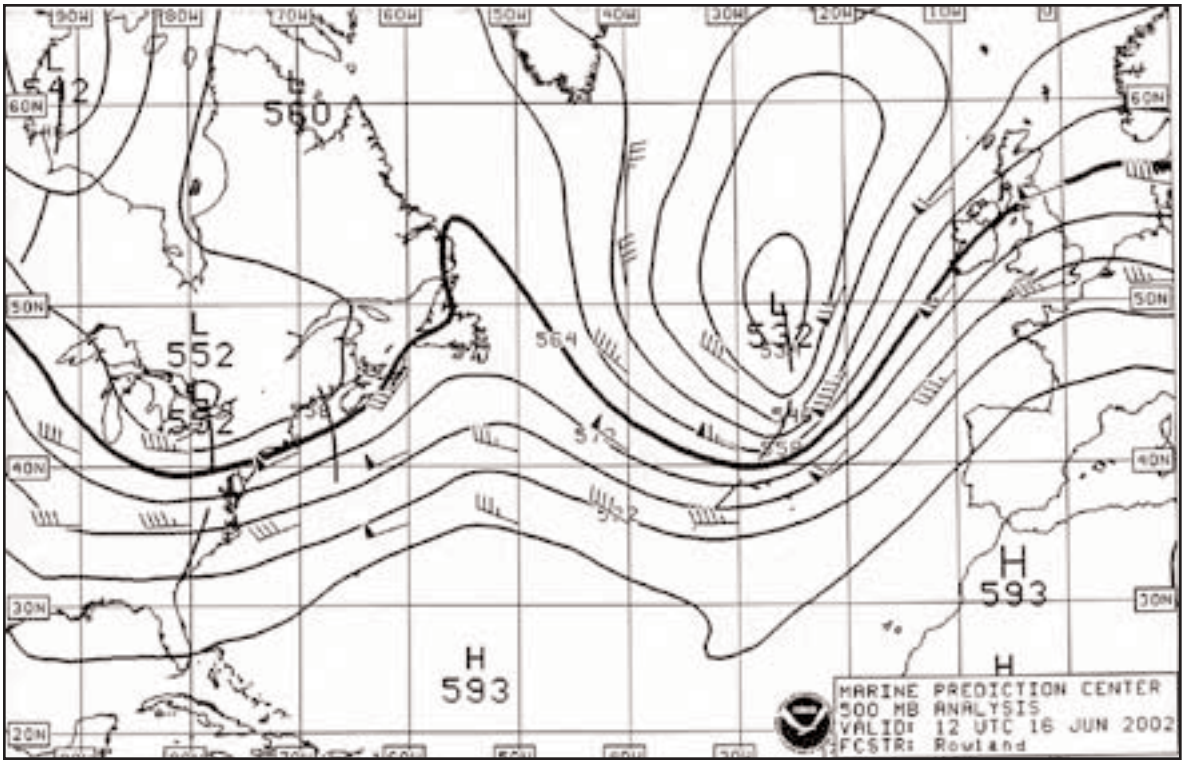


**Figure 10. MPC 500-Mb Analysis of North Atlantic valid at 1200 UTC June 16, 2002. The chart is computer-generated with short-wave troughs (dashed lines) manually added.**

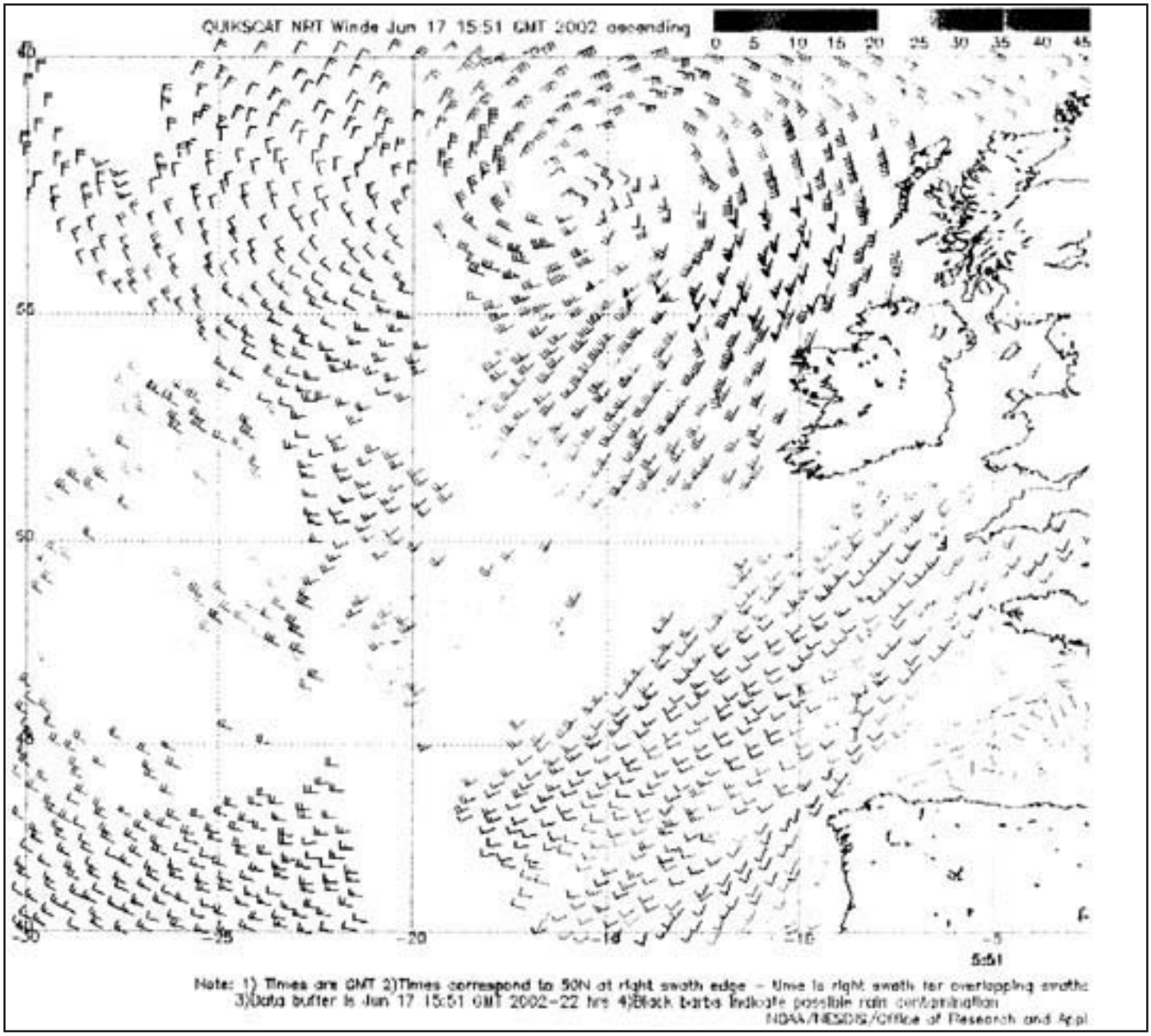


**Figure 11. QuikScat scatterometer image of satellite winds valid approximately 0600 UTC June 17, 2002.**
*(Image courtesy of NOAA/NESDIS/Office of Research and Application)*