

Tropical Cyclone Report
(The Antiguan and Barbudan Experience)
Hurricane Omar
October 13 to 18

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Report in Brief

Omar was a historic tropical cyclone. Since record keeping started in 1851, a tropical cyclone has never formed and intensified into a category four (4) hurricane in the Caribbean Sea, east of 70 degrees west and then move northeastly across the Northeast Caribbean.

Omar was the fourteenth named storm of the 2008 Atlantic Hurricane Season, the seventh hurricane and the fourth major hurricane. At its closest point (from the northwest coast), Omar was approximately 148 miles northwest of Antigua, and 130 miles northwest of Barbuda with maximum sustained winds of 135 miles per hour (mph). However, by definition, the hurricane did not strike Antigua and Barbuda; notwithstanding, the islands experienced minimal tropical storm conditions.

The system caused severe rainfall, which resulted in disastrous flooding. Most of the flooding took place between 0900 and 1600 UTC (5 A.M. and 12 mid day local time) on the morning of October 16, when in excess of five (5) inches of rain fell in most areas. The flooding caused significant damage to agriculture and roads; however there were no loss of lives.

Synoptic History

Omar formed as a result of the combination of a tropical wave and the Tropical Upper-level Tropospheric Trough (TUTT) on October 13, 0600 UTC at 15.4 north latitude and 69.0 west longitude; this is about 488 miles west-southwest of Antigua. The TUTT that eventually combined with the wave to form Omar was across the Eastern Caribbean from as early as October 4. The tropical wave can be traced back to Dakar, Africa on October 3. Thereafter it travelled across the Atlantic, slowly crossed Cayenne in South America on October 7, Barbados on October 10 and into the Caribbean Sea later that day. Shortly thereafter, the wave merged with the TUTT and eventually Omar was formed. Omar was the fourteenth named storm of the 2008 Atlantic Hurricane Season and the seventh hurricane.

Omar struggled initially before it finally blossomed into a strong category four (4) hurricane. For about the first 36 hours, Omar was in an area of great shear and very weak steering currents. Hence, the system drifted in no particular direction for most of October 13 and 14. However, notwithstanding the shear, it managed to reach tropical storm strength by 0000 UTC on October 14 and hurricane strength by 0000 UTC on October 15. Later on October 15, Omar got further embedded into the south-westerlies of the TUTT and rapidly moved off to the northeast. As it

moved off to the northeast, in the same direction as the south-westerlies, the strong shear decreased, and other favourable atmospheric environmental conditions allowed Omar to intensify rapidly into a category two (2) hurricane by 0000 UTC on October 16 and a powerful category three (3) hurricane just three (3) hours later. The system eventually peaked at about 0600 UTC on October 16 with winds of 135 mph and a minimum pressure of 958 millibars (mb), when it was near 18.5 north longitude and 63.8 west longitude or about 58 miles west of St. Martin and Anguilla or 35 miles east of Virgin Gorda. It maintained this wind strength until shortly after 0900 UTC on October 16. Omar went from a depression to a category four (4) hurricane in less than 60 hours. After passing through the islands, strong vertical shear caused the system to weaken rapidly and returned to a tropical storm by 0000 UTC on October 18. In less than 48 hours after reaching its peak, it was a storm again. The shear coupled with cool sea surface temperatures caused it to be weakened to a remnant low on October 18 about 820 miles east of Bermuda. This low moved northeastward and eventually dissipated on October 21 about 650 miles west of the Western Azores Islands.

Special Features

Omar was a historic tropical cyclone. Since record keeping started in 1851, a tropical cyclone has never formed and intensified into a category four (4) hurricane in the Caribbean Sea, east of 70 degrees west and then move northeast across the Northeast Caribbean. The last time a tropical cyclone had a similar path was back in November of 1984, when Tropical Storm Klaus formed in a similar position and moved northeast across Eastern Puerto Rico as a tropical storm. However, Omar reminded Antiguan and Barbudans mostly of Hurricane Lenny of November 1999 which produced similar disastrous flooding.

Effects on Antigua

Wind

The centre of Omar was nearest to Antigua and Barbuda on October 16 at 0800 UTC. At this time, it was located at 18.7 north longitude and 63.4 west longitude; this is approximately 148 miles northwest of (the northwest coast of) Antigua (see figure 5), and 130 miles northwest of Barbuda with maximum sustained winds of 135 mph. The maximum one minute, sustained winds measured at the V. C. Bird International Airport was 40 mph at about 1000 UTC on October 16. At the same time, a gust of 48 mph was recorded. The maximum ten minute, sustained wind speed measured at the airport was 35 mph from 09:50 to 6:00 UTC (See table 1 & figure 1).

Rainfall

Antigua experienced a deluge of rainfall from Omar. Although there was a spectacular lightning storm for most of the night of October 15 into the morning of the 16, showers were generally light. However, this changed very rapidly shortly after 0900 UTC on October 16 when an extremely intense spiral band moved across Antigua and the Southern Leeward Islands. The spiral band extended a few hundred miles in a northeast to southwest orientation, similar to the movement of the hurricane. Once the band moved across the islands from the west, it then followed a northeast path which kept it over the Southern Leeward Islands for several hours. The

strongest portion of the band affected Antigua between 0900 and 1200 UTC (See table 1, figure 2). It caused a peak rain rate of 171 mm or 6.73 inches per hour at the V. C. Bird International Airport on October 16 between 1000 and 1015Z (See figure 3). Other areas saw similar or higher rain rates which resulted in disastrous flooding in many parts of Antigua. In some areas, flood waters reached near the roofs (facia boards) of some houses. In total, Omar produced 232.6 mm of rainfall at the airport over the period October 13, 1500 to October 17, 1200 UTC. The most intense rainfall took place over three (3) hours from 0900 to 1200 UTC on October 16; during that time, 122.3 mm or 4.81 inches were measured at the airport with a peak hourly rainfall accumulation of 56.4 mm or 2.22 inches measured at 1100 UTC (See figure 2). Across the more mountainous southern side of the island, as many as 11 inches of rain fell over the period October 15 and 16.

Storm Surge

Storm surge flooding inundated some coastal areas. The surge was approximately 2 to 4 feet and waves were about 5 to 8 feet.

Casualties and Damage

There were no casualties in spite of the disastrous floods on the morning of October 16; however, there were a few minor injuries. About nine (9) houses were damaged or destroyed. A number of persons had to be rescued from their homes, while others swam to safety. The intense rainfall caused significant landslides in certain parts of the Fig Tree Hill Drive. The rains also caused minor mudslides across some other southern sections. However, the greatest damage was done to (the various areas of) agriculture and roads. Most damage to the country was done by rainfall and flood waters. Overall, according to the National Office of Disaster Services, Antigua and Barbuda experienced about 18 million US dollars in damage.

Omar directly affected the Virgin Islands and many islands of the Northern Leeward Islands with damage from winds, tides and surfs; however, monetary damage figures are not available. Fortunately, the eye of Omar moved through the Anegada Passage, and the core of major hurricane force winds did not impact any inhabited islands. Sombrero Island likely experienced the eye of Omar, but this island is uninhabited.

Forecast and Warning Critique

The rapid intensification of Omar to a powerful category four (4) hurricane was not forecast. At best it was forecast to become a category 3 hurricane. However, this speed was not seen as highly likely as evident by the statement from National Hurricane Center of the United States (NHC) which says that the GFDL model was being bullish when it forecast Omar to reach peak winds of 125 mph. (<http://www.nhc.noaa.gov/archive/2008/al15/al152008.discus.010.shtml?>).

The NHC did well in forecasting the overall rainfall accumulations that were caused by Omar. However, there were no indications of the hourly rain rates. These would have given a clearer picture as to the potential of the massive flooding seen in Antigua and Barbuda.

Date/Time UTC	Hurricane Omar						V. C. Bird Int'l Airport		
	Latitude (N)	Longitude (W)	Distance From Antigua (miles)	Pressure (mb)	Wind Speed (mph)	Stage	Wind Direction (degrees)	Wind Speed (mph)	1 hr Rainfall Accumulation (mm)
15/2100	15.9	66.1	290	973	95	Cat 1	140	09	0.0
15/2200	-	-	-	-	-	-	180	09	0.0
15/2300	-	-	-	-	-	-	220	08	5.8
16/0000	16.7	65.2	226	970	110	Cat 2	000	00	6.9
16/0100	-	-	-	-	-	-	140	06	1.1
16/0200	-	-	-	-	-	-	150	05	0.8
16/0300	17.4	64.5	173	964	125	Cat 3	VRB	01	0.7
16/0400	17.7	64.4	170	-	-	-	VRB	01	2.4
16/0500	17.9	64.2	161	961	120	Cat 3	180	05	0.3
16/0600	18.2	63.9	153	958	135	Cat 4	150	09	5.3
16/0700	18.5	63.8	158	959	125	Cat 3	170	17	0.1
16/0800	18.7	63.4	148	-	125	Cat 3	180	24G41	1.7
16/0900	19.1	63.2	160	964	125	Cat 3	210	23	0.0
16/1000	-	-	-	-	-	Cat 3	210	35G48	45.4
16/1100	-	-	-	-	-	Cat 3	210	23	56.4
16/1200	19.6	62.1	174	967	105	Cat 2	210	12	20.5
16/1300	-	-	-	-	-	-	240	08	9.4
16/1400	-	-	-	-	-	-	230	06	5.8
16/1500	20.2	61.3	210	980	85	Cat 1	200	13	2.6
16/1600	-	-	-	-	-	-	220	07	1.0
16/1700	-	-	-	-	-	-	220	09	0.8
16/1800	21.1	60.4	291	985	85	Cat 1	210	05	0.7
16/1900	-	-	-	-	-	-	240	04	0.2
16/2000	-	-	-	-	-	-	VRB	01	0.0
16/2100	22.1	59.7	367	985	75	Cat 1	VRB	01	0.0

Table 1: The Effect of Hurricane Omar on V. C. Bird International Airport, Coolidge – October 15, 2100 to October 16 2100 UTC

Date/Time UTC	Action
15/0300	Tropical Storm Warning Issued
15/0900	Tropical Strom Warning Continued
15/2100	Tropical Strom Warning Continued
16/0000	Tropical Strom Warning Continued
16/0300	Tropical Strom Warning Continued
16/0500	Tropical Strom Warning Continued
16/0700	Tropical Strom Warning Continued
16/0900	Tropical Strom Warning Continued
16/1200	Tropical Storm Warning Discontinued

Table 2: Warning Summary for Antigua and Barbuda during Hurricane Omar

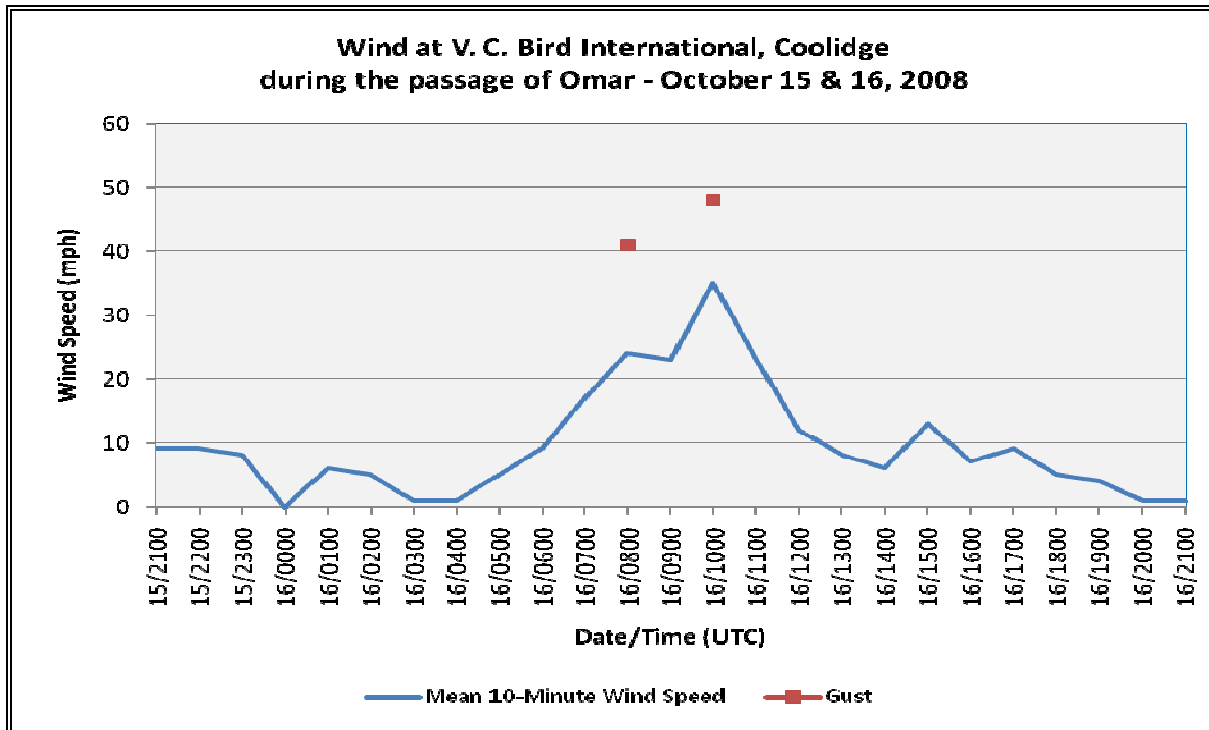


Figure 1: Wind at V. C. Bird International Airport, Coolidge during Hurricane Omar

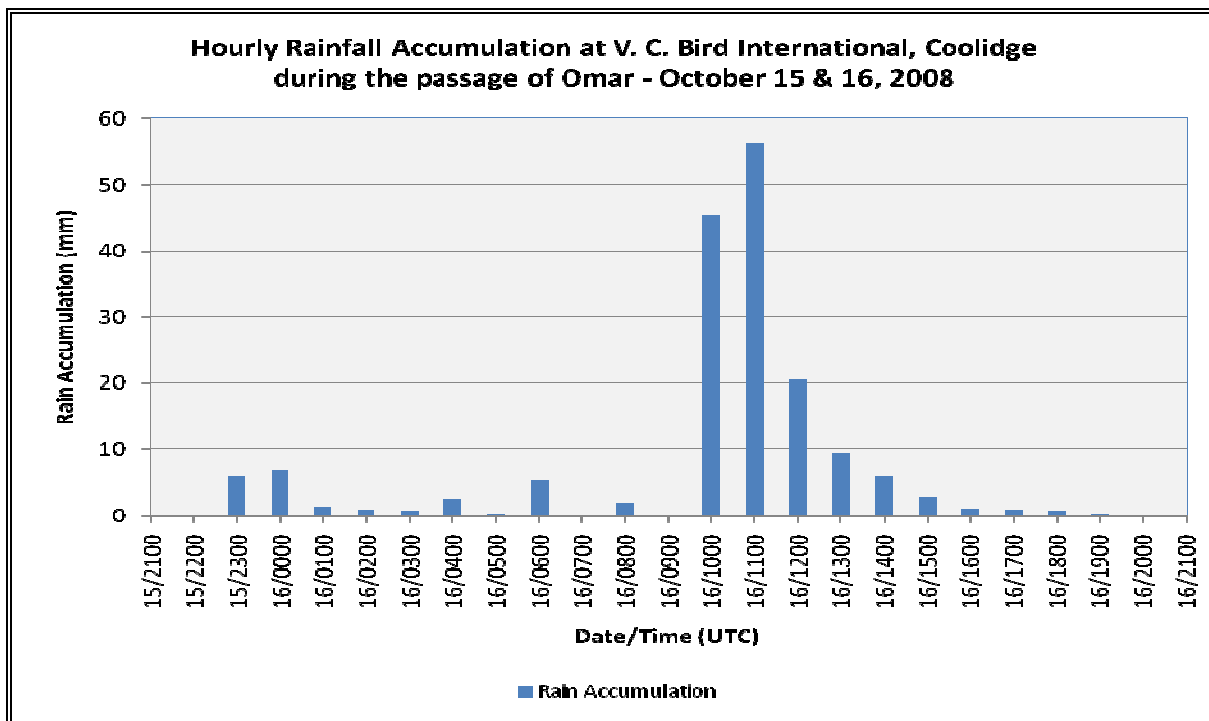


Figure 2: Hourly Rain Accumulation at V. C. Bird International, Coolidge during Hurricane Omar

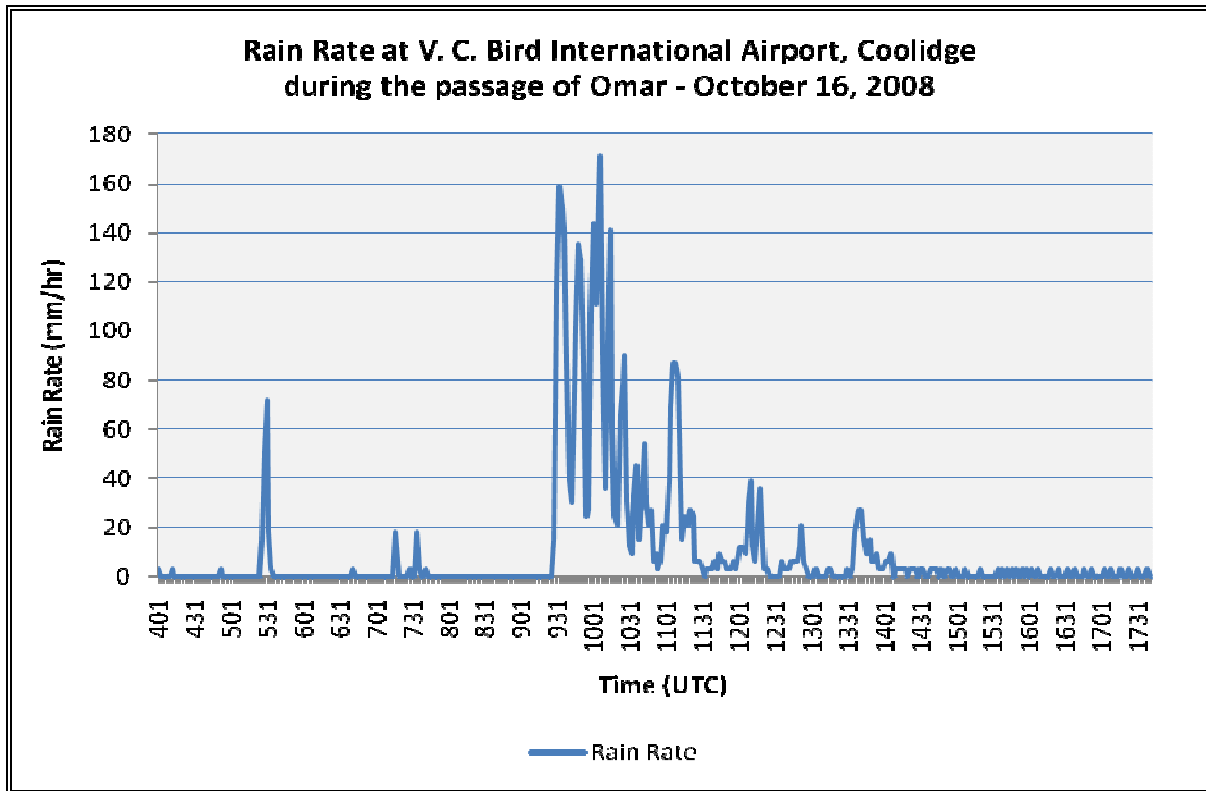


Figure 3: Rain Rate at V. C. Bird International, Coolidge during Hurricane Omar

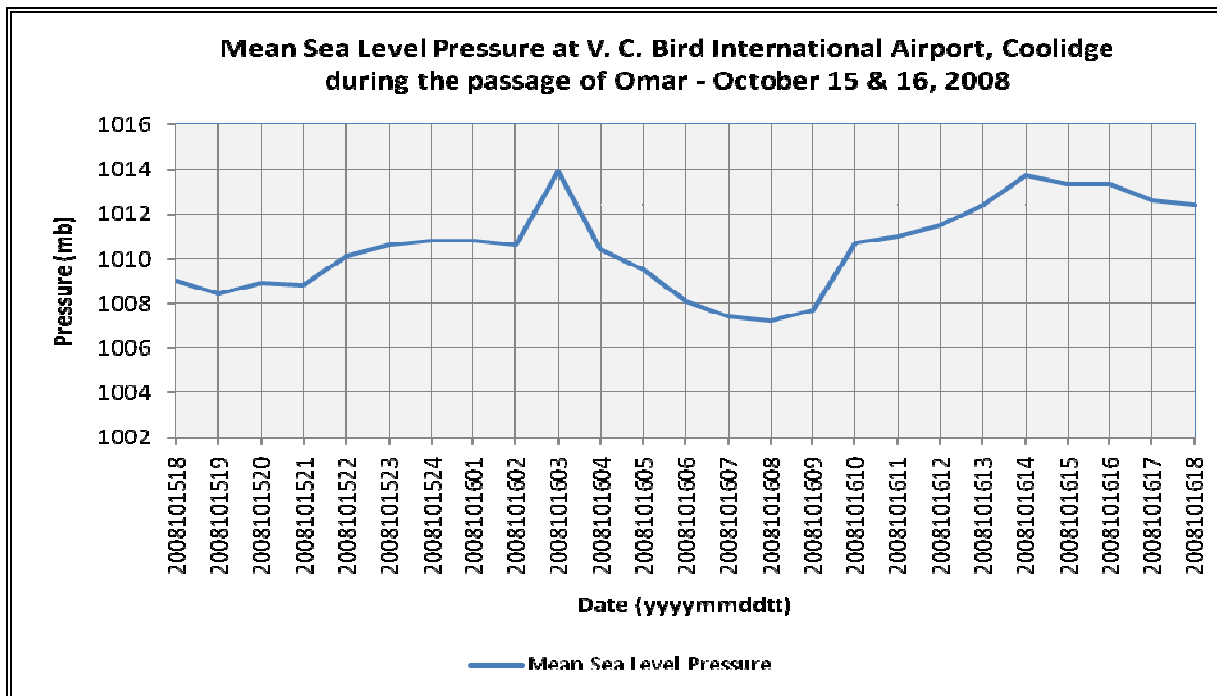


Figure 4: Mean Sea Level Pressure at V. C. Bird International Airport during Hurricane Omar

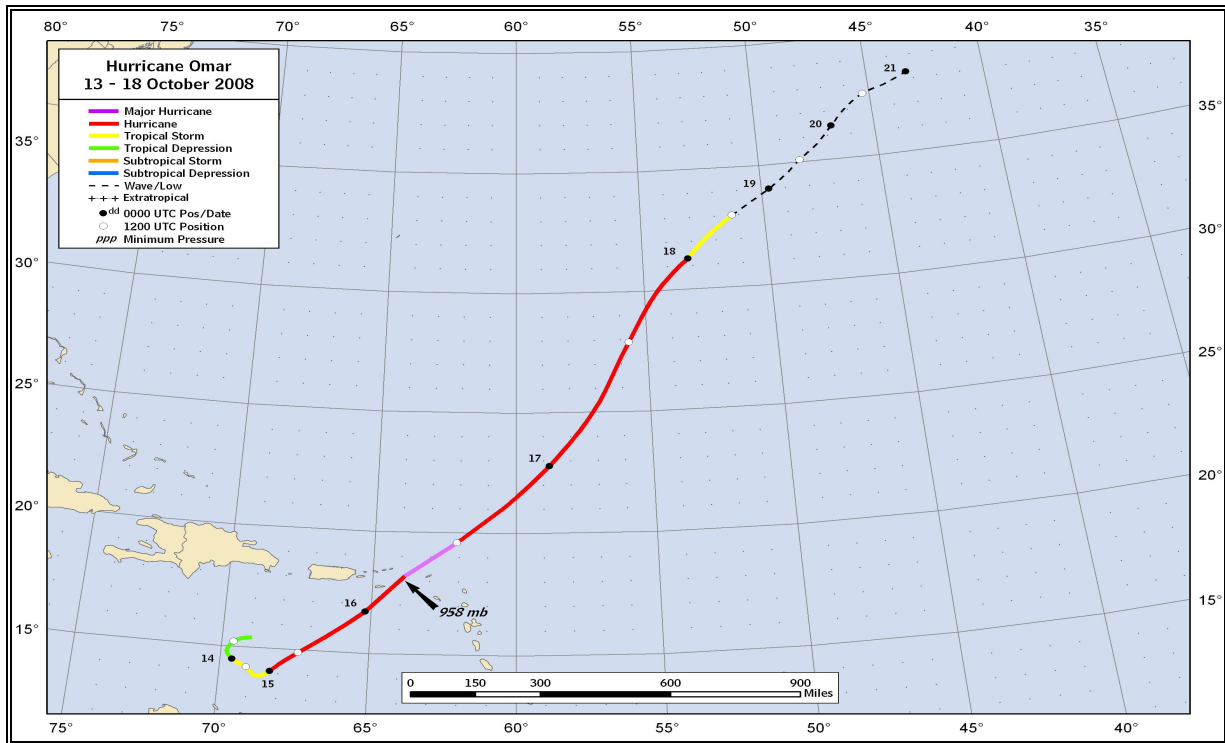


Figure 5: Best Track of Hurricane Omar – October 13 to 18 (Courtesy NOAA)

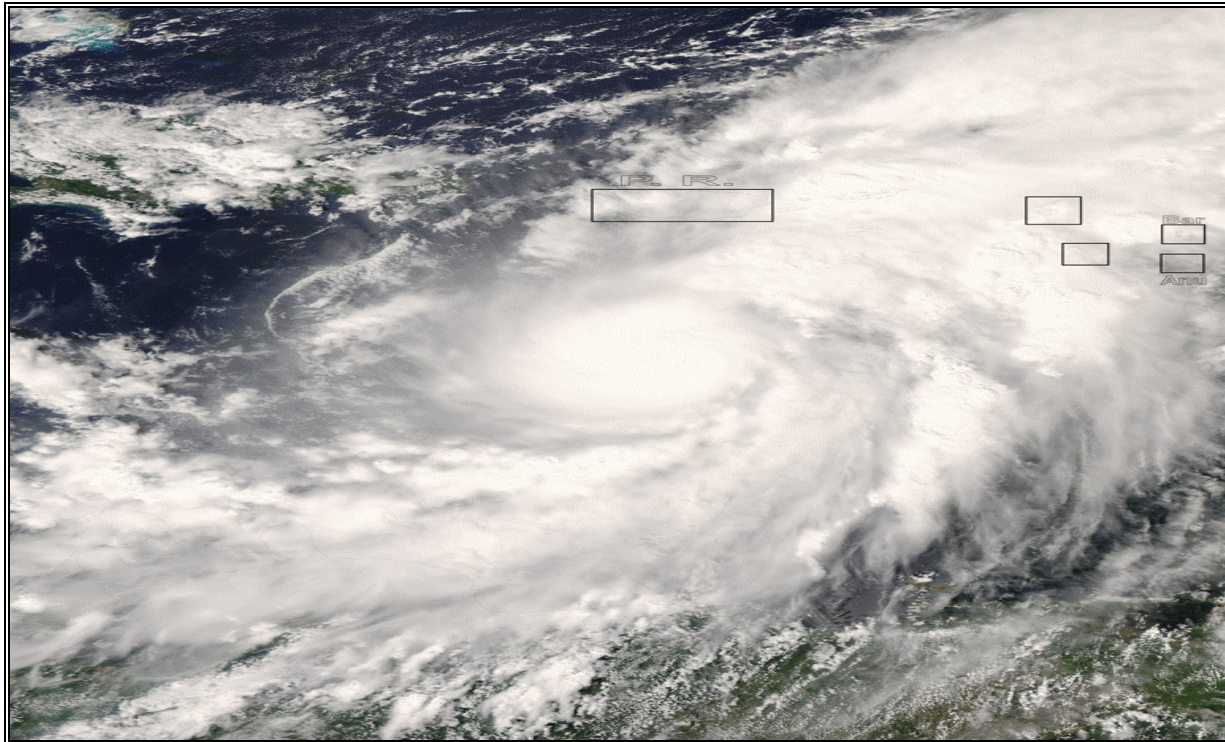


Figure 6: Satellite Photograph of Hurricane Omar 2008-10-15 at 1745 UTC (Courtesy NOAA)

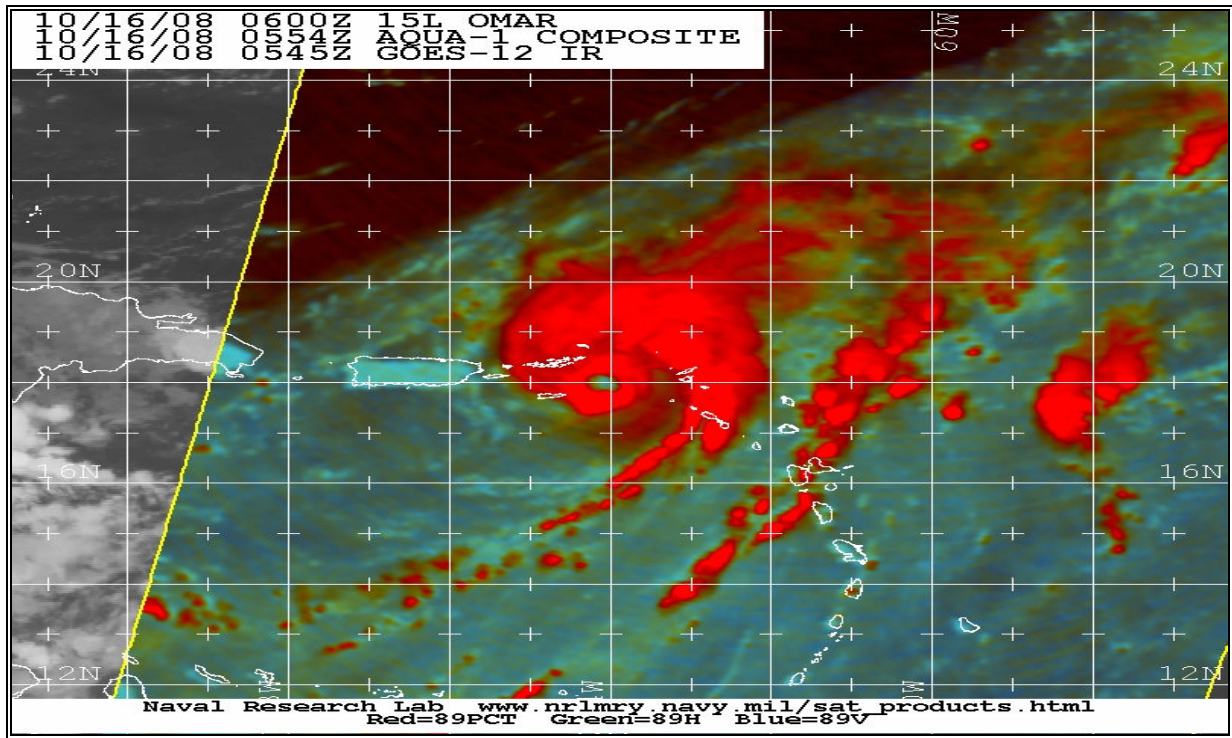


Figure 6: Satellite Photograph of Hurricane Omar 2008-10-16 at 0600 UTC (Courtesy NOAA)