Pyroclastic flow in the Belham Valley from Vulcanian explosion on 8 January 2010 (photo: Adam Stinton)

Open File Report OFR 13-03

7 March 2013
Executive Summary

This report contains all the routine reports of volcanic activity published by the Montserrat Volcano Observatory (MVO) in 2010.

It includes the following reports:

• MVO Weekly Reports for the period 31 December 2009 to 31 December 2010.

• Daily and sub-daily reports issued on the following days:
  o 8 January 2010
  o 10 January 2010 (two reports)
  o 27 June 2010
  o 2 July 2010

The reports are in chronological order.

The text has been edited to correct any obvious errors or typos.
Activity at the Soufrière Hills Volcano has been at a variable level this week.

Cycles of increased activity associated with ash-venting and pyroclastic flows are occurring every 8 to 10 hours. However these cycles have been less well defined and weaker at several times this week. Ash venting plumes on 3 and 4 January reached 15,000 ft and generated fine lapilli (coarse sand sized) fallout deposits on northwestern Montserrat.

There have been one hundred and thirty five rockfall signals, seventy-three long period events, one volcano tectonic and sixteen hybrid earthquakes recorded this week (8 days).

Pyroclastic flows have occurred in Whites Ghaut (northeast), on Farrell's plain (north) and a few in the head of Tyers Ghaut (northwest). The dominant direction of pyroclastic flows is now to the north onto Farrell's plain.

Observations on 2 January showed that a 40 m high, 150 m wide lobe of lava had been extruded onto the northern summit of the dome. This lobe is extruding northwards and is the major source of rockfall and pyroclastic flow activity.

Ashfall has occurred in Old Towne, Salem, Olveston and Woodlands several times this week.

The Hazard Level is 4. There is no access to Zone C and only daytime access (6:30 am to 5:30 pm) to Zone B.

Additional information on the Soufrière Hills Volcano and the Hazard Level System can be found at the MVO website: [http://www.mvo.ms/](http://www.mvo.ms/).
Montserrat Volcano Observatory
Report issued at 18:00 on 8 January 2010

Explosion sends pyroclastic flows down Belham Valley

At 2:40 pm Friday 8\textsuperscript{th} January 2010 a large pyroclastic flow forming event occurred at Soufriere Hills volcano. A collapsing fountain of tephra, associated ballistic with fragments was observed at the start of the event on the northeastern side of the volcano (very similar in character to those which occurred in Summer 1997). Large pyroclastic flows moved both to the northeast, down towards the old airport to the northwest down Tyers Ghaut and into the Belham Valley these flows reached as far as approximately 300 m upstream of the Belham crossing. Pyroclastic flows also moved to the west towards Plymouth, although it is presently unclear whether the actually reached the sea. The event lasted about 11 minutes and seismicity returned to background levels rapidly.

MVO 18:00 8\textsuperscript{th} January 2010
At 1:28 am on Sunday 10th January 2010 a seismic signal was recorded which indicated that another explosion had occurred at Soufriere Hills volcano. The signal lasted approximately 7 minutes and was of a smaller size than the signal associated with the explosion on Friday afternoon. Light ashfall was experienced in Salem and Flemings immediately after the event. Recordings made by the thermal cameras indicate that the event produced pyroclastic flows that moved rapidly to the northeast possibly down Whites Bottom and Tuitts Ghaut. Flows also travelled to the northwest down Tyers Ghaut, but do not appear to have reached the Belham Valley. Pyroclastic flows also moved towards Plymouth down the Gages valley. It is not clear at present whether any flows went into the Tar River Vally or if they actually reached the sea.
Montserrat Volcano Observatory

Report issued on 10 January 2010

A small explosion occurred at 8:27pm at the Soufriere Hills. Seismicity has now returned to background level. There was ash and lapilli fall-out in some inhabited areas. MVO is continuing to monitor the situation.

More details to follow.
Montserrat Volcano Observatory
Weekly Report for the period 8 to 15 January 2010

Activity at the Soufrière Hills Volcano increased significantly during the week with 3 explosions over the weekend of 8-10 January and a resumption of cycles of elevated activity and dome growth.

Three explosions occurred during the week: at 2:49 pm on Friday 8 January and on 1:28 am and 8:27 pm on Sunday 10 January. All were accompanied by seismic signals that lasted 11, 7 and 4 minutes and generated ash plumes that reached altitudes of 25,000, 22,000 and 18,000 feet respectively. Ash fall from the explosions affected occupied areas to the northwest of the volcano and the explosion on Sunday night produced lapilli fall. There was no precursory seismicity associated with any of the explosions.

The explosions occurred from an area located on the northeastern side of the volcano and generated column collapse pyroclastic flows that moved rapidly to the northeast (down Whites Bottom and Tuitts Ghaut), the northwest (down Tyers Ghaut), the west (down Gages Ghaut) and the southeast (down the Tar River Valley). The Friday 8 explosion appears to have been the most energetic. Pyroclastic flows from this event moved down Belham Valley and reached as far as approximately 300 m upstream of the old Belham crossing near Air Studios.

Activity dropped after the explosions but increased again during the night of Tuesday 12 January when a pattern of cycles of elevated activity restarted. During the cycles there is an increase in the number of rock falls, pyroclastic flows and ash venting from the volcano. The gap between these cycles increased from 4-5 hours on 12-13 January to 7-8 hours at the end of the week.

Views of the dome obtained during the week indicate that dome growth has resumed at the volcano. The area of growth appears to be the top, central part of the dome. A well-developed chute towards the northeast is currently focusing most of the rock falls and pyroclastic flows associated with dome growth, into the Whites and Tuitts Ghaut. However, some material is spilling into Gages Ghaut with smaller amounts into Tyers Ghaut.

There have been sixty-eight rock fall signals, twenty-five long period events, two volcano tectonic and ten hybrid earthquakes recorded this week.

The Hazard Level is 4. There is no access to Zone C and only daytime access (6:30 am to 5:30 pm) to Zone B.

Additional information on the Soufrière Hills Volcano and the Hazard Level System can be found at the MVO website: http://www.mvo.ms/.
Activity at the Soufrière Hills Volcano been variable this week.

Dome growth has continued and increased activity is occurring in cycles between 6 and 8 hours apart. These cycles involve ash venting and rockfalls and pyroclastic flows. The intensity of these cycles has decreased slightly through the week. The distribution of activity is to the north through to west, although the largest pyroclastic flows are occurring to the northeast and west.

There have been one hundred and ninety six rock fall signals, thirty-eight long period events, and eighteen hybrid earthquakes recorded this week. A small swarm of seven larger hybrid earthquakes occurred on 20 January.

On 18 January a sustained event occurred on the western side of the volcano lasting 45 minutes. This small dome collapse event produced large pyroclastic flows that travelled down the Gages valley into Spring Ghaut and on into Aymer’s Ghaut, reaching the sea at Kinsale to the south of Plymouth 4 km from the dome. Observations from the helicopter have shown that several houses have been buried and set on fire in Kinsale. Ash clouds associated with these pyroclastic flows reached approximately 10,000 ft.

Light ashfall has occurred in northwestern Montserrat occasionally this week.

The Hazard Level is 4. There is no access to Zone C and only daytime access (6:30 am to 5:30 pm) to part of Zone B.

Additional information on the Soufrière Hills Volcano and the Hazard Level System can be found at the MVO website: http://www.mvo.ms/.
Activity at the Soufrière Hills Volcano remained at a variable level this week.

Periods of increased activity have occurred every 5 to 7 hours. The increased activity, which typically lasts less than an hour, involved ash venting, rockfalls and pyroclastic flows. Sporadic rockfalls and pyroclastic flows also occurred between the periods of increased activity, but at a reduced frequency.

Pyroclastic flows have occurred down several valleys draining the volcano. However there has been a notable increase in pyroclastic flows in the Tar River valley to the east, several of which have reached the sea. These are being sourced from new dome growth in the southeastern part of the summit of the lava dome. Numerous moderate sized pyroclastic flows also occurred to the northeast down Whites Ghaut, to the west down Gages and into Spring Ghaut. Pyroclastic flows also occurred to the northwest approx 2 km down Tyers Ghaut on 25 January.

Clear views of the lava dome on the 28 and 29 January showed that it has continued to change rapidly. The northeastern part of the summit has steep, vertical walls whereas the northwestern part is more rounded.

There have been five hundred and sixty five rock fall signals, one hundred and thirteen long period events, eighteen hybrid earthquakes and two volcano tectonic events recorded this week.

Heavy rain on 25 January caused vigorous steaming of the hot pyroclastic flows in the Belham valley. Small steam explosions caused some ash in the steam plumes. Some lahars were formed at this time.

Ashfall occurred across most of the island on 23 January 2010.

The Hazard Level is 4. There is no access to Zone C and only daytime access (6:30 am to 5:30 pm) to part of Zone B.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: http://www.mvo.ms/
Activity at the Soufrière Hills Volcano remained at a variable level this week.

Cycles of increased activity have occurred every 7 to 12 hours. The increased activity, has mainly involved ash venting, rockfalls and pyroclastic flows. Sporadic rockfalls and moderate sized pyroclastic flows have also occurred between the cycles of increased activity. The intensity of the cycles has varied through the week.

The dominant direction of pyroclastic flows has been to the west down Gages and into Spring Ghaut. The maximum runout of pyroclastic flows was about 3 km, although more typically around 2 km. Helicopter observations have shown that the head of Spring Ghaut is now nearly full of pyroclastic flows deposits. Pyroclastic flows have also occurred to the northeast in the Whites Ghaut direction and rockfall activity has been abundant across the northern flank of the volcano.

Glimpses of the lava dome on 5 February showed that the central western part of the lava dome has increased in height to around 1070 m.

There have been five hundred and fifty two rock fall signals, eighty-seven long period events, sixty-four hybrid earthquakes and six volcano tectonic events recorded this week.

Ashfall occurred across northwestern Montserrat on 4 February 2010.

The Hazard Level is 4. There is no access to Zone C and only daytime access (6:30 am to 5:30 pm) to part of Zone B.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has increased significantly this week with two vulcanian explosions and a partial dome collapse.

The two explosions occurred at 1:49 pm on Friday 5 February and 7:57 pm on Monday 8 February, lasted 7 and 6 minutes and ash plumes reached 25,000 and 15,000 ft respectively. There was no ashfall from either explosion in inhabited regions of Montserrat. Pyroclastic flows associated with the explosion on 5 February reached the sea at Aymers Ghaut and smaller pyroclastic flows (maximum run out 2 km) also occurred in several other valleys including Tyers ghaut. The 8 February explosion generated pyroclastic flows only in the Gages valley and these did not reach the sea.

During the first part of the week activity was concentrated on the western side of the dome. Beginning on 9 February the focus of activity shifted from the west more to the northern side of the lava dome, although pyroclastic flows on the morning of 11 February travelled to the west, northeast and north simultaneously.

The dome collapse event on 11 February lasted 55 minutes starting at 12:35 pm and reaching a peak at 13:04, although there were several pulses. Pyroclastic flows moved mainly to the northeast travelling across the sea at several points on the eastern side of the island. Pyroclastic surges moving over the sea on the eastern side of the island were visible from Lookout village. Significant deposition from pyroclastic flows has extended the coastline several hundred meters at the old Bramble airport. Pyroclastic flows also travelled northwest into Tyers Ghaut and down the Belham valley as far as Cork Hill. The ash plume reached 50,000 ft (from pilot reports) and drifted east and then southeast. Ashfall occurred in northeastern Montserrat, and was reported in southwest Antigua, Guadeloupe and Dominica. A large collapse scar has been excavated into the northeastern flank of the dome, although the summit of the original southwestern portion is still intact.

There have been five hundred and twelve rock fall signals, one hundred and forty one long period events, eighty two hybrid earthquakes and four volcano tectonic events recorded this week.

The Hazard Level is 4. There is no access to Zone C and only daytime access (6:30 am to 5:30 pm) to part of Zone B.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been fifty three rock fall signals, thirty four long period events, four hybrid earthquakes and one volcano tectonic event recorded this week.

There have been sporadic rockfalls occurring off the inner walls of the collapse scar formed by the 11 February event. In addition rockfalls have been generated from the dome summit region into Gages valley. On Sunday 14 February at 14:35 there were a series of four moderate-sized pyroclastic flows into Gingoes Ghaut to the southwest. These pyroclastic flows generated ashfall in inhabited areas of northwestern Montserrat.

Clear views of the dome this week have revealed that the dome collapse scar on the northern flank of the volcano formed by the dome collapse event on the 11 February is approximately 300 metres wide. Separate from the collapse scar is a deep crater of a similar diameter in the summit of the lava dome. The pyroclastic flows formed on the 11 February have extended the coastline by a maximum of 650 metres to the east. MVO staff measured temperatures of 470°C at Trants on Monday 15 February, these deposits will retain such high temperatures for months.

It is at present unclear whether there is any new dome growth within the crater. However FTIR (Fourier Transform Infrared) measurements on the afternoon of the 17 February gave a hydrochloric acid /sulphur dioxide ratio of 0.76, which is consistent with quite slow extrusion of lava on that day.

The Hazard Level is 4. There is no access to Zone C and only daytime access (6:30 am to 5:30 pm) to part of Zone B.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been eleven rock fall signals and six hybrid earthquakes recorded this week.

The few rockfalls that have taken place are mainly occurring from the walls of the collapse scar formed on the 11 February event. Night-time views of the dome show that in several places there are small points of incandescence visible to the naked eye.

FTIR (Fourier Transform Infrared) gas measurements on the 19 and 22 February gave a hydrochloric acid /sulphur dioxide ratio of 0.74 and 0.7, which is consistent with quite slow extrusion of lava. However MVO have not yet been able to make observations into the deep crater that exists in the summit of the dome.

The Hazard Level is 3 (as of 23 February 2010). There is no access to Zone C.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been seven rock fall signals, one long-period and nine hybrid earthquakes recorded this week.

During the early hours of 4 March there was a small swarm of seven relatively large hybrid earthquakes. Later in the morning of Thursday 4 March there were two small pyroclastic flows in the Tar River valley, which resulted in light ashfall in Salem and Olveston.

FTIR (Fourier Transform Infrared) gas measurements on the 1, 2 and 4 March gave hydrochloric acid /sulphur dioxide ratios of 0.81, 0.71 and 0.98 respectively which is a slight increase on previous weeks values.

Observations of the inside of the crater at the summit of the dome on 26 February showed that it is shallow < 100 m deep and approximately 200 m wide. There was no newly extruded lava visible inside the crater.

There has been a strong smell of sulphur in some areas of Montserrat at several times this week. This is due to the wind direction causing the gas plume from the volcano to drift across inhabited areas.

The Hazard Level is 3. There is no access to Zone C.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been moderate this week.

There have been forty seven rock fall signals, nine long-period, seven hybrid earthquakes and two volcano tectonic events recorded this week. A small swarm of six hybrid earthquakes occurred on 11 March.

Heavy rain on 8 and 9 March caused some degradation of the remaining remnants of the lava dome. As a result a series of small to moderate pyroclastic flows moved down Gages valley to the west on 9 March. The maximum runout of these pyroclastic flows was about 2 km. Ashfall occurred in northeasternMontserrat as a result of these pyroclastic flows.

The heavy rainfall this week has caused vigorous steaming of the deposits formed on 11 February that are still hot. Strong geysering was visible at Trants near the old Bramble airport with ash and steam fountaining occurring. In addition lahars travelled down several drainages around the volcano, including the Belham valley.

The Hazard Level is 3. There is no access to Zone C.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: [www.mvo.ms](http://www.mvo.ms).
Montserrat Volcano Observatory

Weekly Report for the period 12 to 19 March 2010

Activity at the Soufrière Hills Volcano has been low this week.

There have been forty one rock fall signals, three long-period, seven hybrid earthquakes recorded this week.

Small spots of incandescence on the dome were visible to the naked eye on 14 March. Occasional small pyroclastic flows and rockfalls are still occurring mainly from the western and southern parts of the dome, and these may occur at any time without warning.

FTIR (Fourier Transform Infrared) measurements this week gave a hydrochloric acid /sulphur dioxide ratio of 0.6. The sulphur dioxide flux on 17 March was 2315 tons per day.

The Hazard Level is 3. There is no access to Zone C.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at www.mvo.ms.
Montserrat Volcano Observatory

Weekly Report for the period 19 to 26 March 2010

Activity at the Soufrière Hills Volcano has been low this week.

There have been twenty eight rock fall signals, three long-period, three hybrid and one volcano tectonic earthquake recorded this week.

Sporadic small to moderate pyroclastic flows are still occurring on the western and southern flanks of the lava dome. The largest pyroclastic flow, with a runout of 2 km to the west down Spring Ghaut, occurred on the evening of Thursday 25 March.

The average sulphur dioxide flux this week was 342 tons per day, with a daily minimum of 256 and a maximum of 540 tons per day.

The Hazard Level is 3. There is no access to Zone C.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at the MVO website: [www.mvo.ms](http://www.mvo.ms).
Activity at the Soufrière Hills Volcano has been low this week.

There have been seventeen rock fall signals, and one hybrid earthquake recorded this week.

Sporadic rockfalls and pyroclastic flows are still occurring on the western and southern flanks of the lava dome.

The average sulphur dioxide flux this week was 194 tons per day, with a daily minimum of 105 and a maximum of 304 tons per day.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Montserrat Volcano Observatory

Weekly Report for the period 2 to 9 April 2010

Activity at the Soufrière Hills Volcano has been low this week.

There have been nine rock fall signals, one long period, three hybrid and three volcano tectonic earthquakes recorded this week.

Sporadic rockfalls are still occurring from several areas of the lava dome.

The average sulphur dioxide flux measured for three days this week was 376 tons per day, with a daily minimum of 213 and a maximum of 640 tons per day.

Several small areas of incandescence (glowing) visible to the naked eye have been seen on the lava dome on a number of nights this week. These are probably due to hotter areas of the dome being exposed by small rockfalls.

Heavy rain on the eastern side of the island on the 2 April caused lahars in the Farm River and Trants area.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at the MVO website: [www.mvo.ms](http://www.mvo.ms).
Activity at the Soufrière Hills Volcano has been low this week.

There have been seven rock fall signals, two long period, three hybrid and one volcano tectonic earthquakes recorded this week.

Several rockfalls occurred on the western side of the lava dome on 15 April and a small pyroclastic flow occurred on the Gages fan on 16 April. These were probably caused by the heavy rainfall this week causing small amounts of destabilisation on the remaining parts of the lava dome.

The average sulphur dioxide flux measured for five days this week was 400 tons per day, with a daily minimum of 242 and a maximum of 530 tons per day. Fourier Transform infrared measurements on the 9 April gave a hydrochloric acid /sulphur dioxide ratio of 0.45.

Heavy rain this week has generated lahars (mudflows) on several flanks of the volcano. On afternoon of 13 April large lahars occurred in the Belham valley. Many of these lahars were hot with abundant steam and geyersing associated with them. Two large fans were formed at the coast of Old Road Bay as a result of these events. These were the largest lahar events to have occurred since November 2009.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at the MVO website: www.mvo.ms.
Montserrat Volcano Observatory
Weekly Report for the period 16 to 23 April 2010

Activity at the Soufrière Hills Volcano has been low this week.

There have been twenty one rock fall signals, three long period, two hybrid and two volcano tectonic earthquakes recorded this week.

Rockfalls were observed occurring on the eastern side of the dome moving into the Tar River Valley on 20 April and on western side of the lava dome above Gages on 22 April. The average sulphur dioxide flux measured for four days this week was 234 tons per day, with a daily minimum of 66 and a maximum of 405 tons per day.

Small lahars associated with rainfall occurred in the Belham Valley on 17 and 18 April.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been twenty two rock fall signals, nineteen long period, four hybrid and two volcano tectonic earthquakes recorded this week.

A small swarm of five large hybrid and volcano tectonic earthquakes occurred on the morning of 25 April.

The average sulphur dioxide flux measured for five days this week was 307 tons per day, with a daily minimum of 112 and a maximum of 509 tons per day. FTIR (Fourier Transform Infrared) measurements on two days this week gave hydrochloric acid /sulphur dioxide ratios of 0.46 and 0.42 respectively.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been fifteen rock fall signals, two long period, one hybrid and four volcano tectonic earthquakes recorded this week.

A moderate pyroclastic flow was observed in the Tar River valley at 17:01 on 3 May stopping some 1 km short of the sea.

The average sulphur dioxide flux measured for six days this week was 728 tons per day, with a daily minimum of 147 and a maximum of 1652 tons per day.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been seventeen rock fall signals, two long period, one hybrid earthquakes recorded this week.

A moderate pyroclastic flow was observed moving down the Gages valley on the western side of the volcano on Monday 10 May. It had a maximum runout of about 2 km.

The average sulphur dioxide flux measured for seven days this week was 549 tons per day, with a daily minimum of 184 and a maximum of 1824 tons per day.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been six rock fall signals, and three volcano tectonic earthquakes recorded this week.

The average sulphur dioxide flux measured for seven days this week was 267 tons per day, with a daily minimum of 129 and a maximum of 587 tons per day.

Helicopter observations this week showed that there were no major changes on the lava dome, however sporadic rockfalls are still occurring on several areas of the dome.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at the MVO website: www.mvo.ms.
Montserrat Volcano Observatory

Weekly Report for the period 21 to 28 May 2010

Activity at the Soufrière Hills Volcano has been low this week.

There have been fifteen rockfall signals, three long-period earthquakes and two volcano-tectonic earthquakes.

The average sulphur dioxide flux measured for five days this week was 312 tons per day, with a daily minimum of 184 and a maximum of 565 tons per day.

Helicopter observations showed that there were no major changes on the lava dome and sporadic rockfalls are still occurring.

The volcano has been very smelly at times. This is because the dominant wind direction has been towards the north for much of the past week, blowing the plume over inhabited areas. The wind also brought some very light ashfall associated with the larger rockfalls.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There were sixteen rockfall signals, one long-period earthquake and six volcano-tectonic earthquakes.

The average sulphur dioxide flux was 235 tons per day, with a minimum of 200 and a maximum of 266. This is probably an under-estimate of the true flux, as the plume was blown towards the north for much of the week, close to the edge of the coverage of the gas sensors, and it was only possible to obtain measurements for three days.

Residents may have observed some very light ashfall caused by rockfalls as well as volcanic smells when the wind has been towards the north.

There has been a noticeable atmospheric haze around Montserrat. This is not related to the volcano and is caused by Saharan dust blown across the Atlantic.

Helicopter observations showed no major changes to the lava dome.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There were forty rockfall signals, one long-period earthquake and two volcano-tectonic earthquakes recorded.

The average sulphur dioxide flux was 284 tons per day, with a minimum of 165 and a maximum of 465. Fourier Transform Infrared measurements show ratios of 0.41 which is consistent with other measurements made in the last few months.

There have been a number of rockfalls and small pyroclastic flows generated from the dome this week. One of the largest occurred within the collapse scar and travelled north with a runout of approximately 1 km. This activity demonstrates that the remnants of the lava dome are still unstable and liable to collapse at any time. Observations from the helicopter this week have shown that there are no major changes to the morphology of the dome.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There were twenty six rockfall signals, two long-period earthquake and three volcano-tectonic earthquakes recorded.

The average sulphur dioxide flux from seven days this week was 194 tons per day, with a minimum of 133 and a maximum of 365.

As with last week there have been a number of small to moderate pyroclastic flows generated. One of the largest occurred to the west down Gages valley, although others have occurred in the collapse scar. It seems likely that these are being generated by the heavy rainfall that has taken place recently. MVO’s thermal camera is showing several hot areas on the lava dome. This is due to the cold carapace of the dome being removed as small pyroclastic flows and rockfalls revealing the hotter lava underneath.

On Friday 18 June at 6:30 am a small lahar occurred in the Belham valley. People in the Belham valley region should remain vigilant, as further lahars are likely and these can develop very quickly due to localised nature of intense rainfall activity.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

14 rockfall signals and 11 volcano-tectonic earthquakes were recorded.

The average sulphur dioxide flux for five days this week was 216 tons per day, with a minimum of 107 and a maximum of 283.

On Thursday 24 June at 11:00 pm a lahar occurred in the Belham valley. People in the Belham valley region should remain vigilant, as further lahars are likely and these can develop very quickly due to the localised nature of intense rainfall that is common at this time of the year.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at the MVO website: www.mvo.ms.
Mild Ash Venting

Starting on the 25 June 2010, mild ash venting has been occurring from Soufriere Hills volcano. This is the first time such activity has been seen since February this year. A light dusting of ash fall has been experienced in several places across the island. The onset the ash venting was broadly coincident with a small swarm of Volcano Tectonic earthquakes that occurred, both on 23 and 25 June. An observation flight with the helicopter of HMS Manchester on Saturday 26 June revealed that the ash venting was occurring from two separate locations: one in the southern part of the crater formed on 11 February and one from the collapse scar, at about the location of the old rim of English’s crater.

Audible roaring, associated with the venting, was heard from several locations on the island on the night of 25 and 26 June.

It is unclear what the significance of this venting activity is, apart from the short swarms VT earthquakes on Friday 25 June there is no discernable seismicity associated with the venting. It is possible that this venting is ‘phreatic’ in nature, related to groundwater interacting with hot rock below the surface. There has been a lot of heavy rainfall experienced recently. However the presence increased VT earthquakes are often associated with the onset of the extrusion of lava, and similar activity has been observed just prior to lava extrusion, such as in 2008.
Activity at the Soufrière Hills Volcano has been slightly higher this week.

Twenty four rockfall signals, one long period, and fifteen volcano-tectonic earthquakes were recorded this week.

Mild ash venting was observed this week, starting just after a small swarm of volcano-tectonic earthquakes on 25 June. Helicopter observations and ground based observations showed the venting was occurring from two locations: in the collapse scar near the northern rim of English’s crater, and also from the summit crater. Light ashfall was reported in several areas of Montserrat on 26 and 27 June and roaring associated with the venting was audible across the island. Ash venting diminished on 28 June.

The average sulphur dioxide flux for five days this week was 342 tons per day, with a minimum of 152 and a maximum of 556. The sulphur dioxide flux has effectively doubled since the ash venting began on 25 June. Fourier Transform Infrared measurements on 27 June gave a ratio of 0.27 indicating HCl levels are stable.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Further Ash Venting on 2 July

On Friday 2 July 2010 a second period of ash venting occurred at Soufriere Hills volcano. Two volcano tectonic and two long-period earthquakes occurred beginning at 11:45 am on 2 July and this was followed about 45 minutes later by the emission of ash, that was blown to the WNW and falling in the Gages, Plymouth, Foxes Bay region. Occasional rumbling noises could be heard associated with the venting. At the time of writing ashfall was not occurring in inhabited areas.

This episode of ash venting appears to be more intense than that which began on 25 June 2010, in addition there was a discernable low-level tremor signal associated with this venting.
Activity at the Soufrière Hills Volcano has been slightly higher this week.

There have been nineteen rockfall signals, four long period, four volcano-tectonic and two hybrid earthquakes were recorded this week.

A brief pulse of ash venting lasting approximately 90 minutes occurred on 2 July at around 12:00 midday following two volcano tectonic and two long period earthquakes. The ash venting was more intense than that of the previous week, however fallout was restricted to uninhabited areas near Plymouth, on the western side of the volcano.

Roaring has been heard from the volcano a number of times this week, reminiscent of a distant jet engine, from regions to the north of the volcano both inside and outside the exclusion zone. This roaring sound is related to strong venting from fumaroles either with or without ash emission.

The average sulphur dioxide flux for five days this week was 327 tons per day, with a minimum of 212 and a maximum of 448. FTIR ratio on the 7 July was 0.38 which is similar to previous readings in June.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been twenty rockfall signals, three volcano-tectonic and two hybrid earthquakes recorded this week.

Helicopter observations on 15 July revealed no major changes to the dome, although there were some fresh rockfall and small pyroclastic flow deposits at the head of the Gages valley.

The average sulphur dioxide flux for seven days this week was 244 tons per day, with a minimum of 138 and a maximum of 372.

Heavy rain this week has generated a few lahars in the Belham valley. The largest was just after midnight on 16 July and lasted approximately 30 minutes.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been twelve rockfall signals, three hybrid and one long period earthquakes recorded this week.

Overcast weather conditions for most of the week prevented any clear observations of the dome.

The average sulphur dioxide flux for seven days this week was 459 tons per day, with a minimum of 332 and a maximum of 654.

Heavy rain this week generated a few lahars in the Belham valley. The largest started at approximately 2:20pm on 20 July and lasted approximately 40 minutes.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been ten rockfall signals and two volcano tectonic earthquakes recorded this week.

Helicopter observations on 28 July revealed no major changes to the dome.

The average sulphur dioxide flux for seven days this week was 259 tons per day, with a minimum of 205 and a maximum of 286.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Montserrat Volcano Observatory

Weekly Report for the period 30 July to 6 August 2010

Activity at the Soufrière Hills Volcano has been low this week.

There have been six rockfall signals, two long-period, four hybrid and two volcano tectonic earthquakes recorded this week.

Overcast weather conditions for most of the week prevented any clear observations of the dome.

The average sulphur dioxide flux for seven days this week was 232 tons per day, with a minimum of 173 and a maximum of 393.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has continued to be low this week.

There have been twenty-seven rockfall signals, two long-period, five volcano tectonic and two hybrid earthquakes recorded this week.

Reasonably clear conditions for most of the week allowed observation of mild ash and steam venting and slightly increased rockfall activity. Most of the activity was focused in the collapse scar and above the Gages valley.

On Friday 6 August at 4:21 pm a small ash plume rose to about 1000 feet above the dome. It was not clear whether this was due to a single ash venting pulse or a large rock fall into the collapse scar on the dome. On Sunday 8 August at 5:10 am a pyroclastic flow went into the Gages valley.

Helicopter observations and ground based observations during the week indicate that there are no significant changes in the dome.

No SO$_2$ figures are available at the time of reporting.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week. There have been twenty nine rockfall signals, four long-period, one volcano tectonic and one hybrid earthquake recorded this week.

A number of small to moderate rockfalls and pyroclastic flows have occurred this week, most of which have been sourced from the western side of the lava dome and traveled down the Gages valley. The maximum runout of these pyroclastic flows was around 2 kilometers and the ash clouds associated with them were only weakly convective. Some of these flows were probably triggered by heavy rainfall.

Clear views of the volcano on the afternoon of 19 August showed that there have been no significant changes to the lava dome.

The average SO₂ measurement for a ten day period from 5 to 16 August is 396 tons per day, with a maximum of 1153 and a minimum of 221 tons per day.

A small lahar was formed in the Belham valley associated with intense rainfall on 19 August.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at the MVO website: www.mvo.ms.
Montserrat Volcano Observatory
Weekly Report for the period 20 to 27 August 2010

Activity at the Soufrière Hills Volcano has been low this week.

There have been nineteen rockfall signals, three long-period, two volcano tectonic and one hybrid earthquake recorded this week.

Minor degradation of the lava dome continues with occasional small pyroclastic flows. Most of these have travelled down the Gages valley to the west, however a few have occurred on the eastern side in the Tar River. Good views from the helicopter this week have shown that there are two clear chutes of fresh rockfall and pyroclastic flow debris at the head of the Gages valley and that the Tar River flows were sourced from the large vertical face on the south-eastern side. The maximum runout of the pyroclastic flows was around 1.5 km and ash clouds associated with them were weakly convective rising to only a few hundred meters.

The average SO$_2$ measurement for eight days between the 17 and 25 August is 303 tons per day, with a maximum of 515 and a minimum of 162 tons per day. Strong sulphurous smells on the morning of the 27 August were due to the southerly winds blowing the gas plume over inhabited areas of Montserrat.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been eight rockfall signals, one long-period, four volcano tectonic and four hybrid earthquake recorded this week.

The average SO2 measurement for two days this week is 376 tons per day, with a maximum of 428 and a minimum of 324 tons per day.

During the passing of Hurricane Earl on the night of 29 and 30 August MVO recorded 290 mm (11.4 inches) of rainfall.

There are no major changes visible on the lava dome as a result of the rain, however there were large and extensive lahars in most valleys, including the Belham valley. In addition there were extensive debris flows in the Nantes river, Runaway and Cassava Ghauts on the western side of the island, the deposits of which temporarily blocked the main road from Salem to the north.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been eighteen rockfall signals, two long-period, one volcano tectonic and four hybrid earthquake recorded this week.

Several small to moderate sized pyroclastic flows occurred this week. The largest of these took place on 9 September at 6:50am when a pyroclastic flow travelled down the Gages valley, with a runout > 2 km. This was the largest pyroclastic flow to have occurred for several months. As a result of the pyroclastic flows MVOs thermal camera is displaying several hotter regions on the lava dome. This is caused by the colder parts of the dome carapace being removed by the pyroclastic flows revealing the hotter interior of the dome.

The average sulphur dioxide measurement for six days this week was 259 tons per day, with a maximum of 306 and a minimum of 211 tons per day. Hydrochloric acid measurements using the Fourier Transform Infrared instrument gave concentrations of 0.03 ppm consistent with those measured in August.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been eighteen rockfall signals, one long-period, and three volcano tectonic earthquakes recorded this week.

Clear views on the morning of the 14 September have shown that there has been almost no change to large parts of the lava dome since March this year. The summit and southern flank have been particularly stable. However good views from the helicopter this week of the western face of the lava dome have shown that there is considerable erosion undercutting below the highest part of the dome. Such erosion, which is mainly rainfall generated, will continue to cause minor destabilisation of the lava dome and generate rockfalls and pyroclastic flows into the Gages valley over the coming weeks.

The average sulphur dioxide measurement for six days this week was 372 tons per day, with a maximum of 666 and a minimum of 177 tons per day.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been ten rockfall signals, one long-period, and one volcano tectonic earthquake recorded this week.

The average sulphur dioxide measurement for three days this week was 231 tons per day, with a maximum of 273 and a minimum of 157 tons per day.

A small to moderate pyroclastic flow, with a runout of ~1.5 km, occurred in the Tar River valley on the evening of 21 September.

At the present time there are three large vertical, or in places overhanging, faces on the lava dome. These are: on the southeast side above the Tar River valley; in the collapse scar to the north, and above the Gages valley to the west. Sporadic pyroclastic flows will almost certainly occur from these three areas in the coming weeks and months.

Heavy rain generated lahars in the Belham valley overnight on 19 and 20 September. Lahars are relatively frequent at this time of year and care should be taken when crossing the Belham valley.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been twenty six rockfall signals, one long-period, and two volcano tectonic earthquakes recorded this week.

The average sulphur dioxide measurement for seven days this week was 218 tons per day, with a maximum of 302 and a minimum of 141 tons per day. Fourier Transform infrared measurements gave HCL/SO2 ratios of around 0.4 this week and are consistent with periods of no lava extrusion.

There have been several moderate sized pyroclastic flows that have moved down the Gages valley and into Spring Ghaut this week. The largest of these occurred on 25 September and had a runout of approximately 2 km. These flows were sourced from the undercut western side of the remnant lava dome that had previously been identified as being unstable.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at www.mvo.ms.
Montserrat Volcano Observatory

Weekly Report for the period 1 to 8 October 2010

Activity at the Soufrière Hills Volcano has been low this week.

There have been three rockfall signals, one long-period, and three volcano tectonic and two hybrid earthquakes recorded this week.

The average sulphur dioxide measurement for three days this week was 248 tons per day, with a maximum of 431 and a minimum of 151 tons per day, although these values could be underestimates owing to the heavy rainfall this week.

A moderate sized pyroclastic flow moved down the Gages valley and into Spring Ghaut on 2 October. The removal of dome material has resulted in some visible changes to the steep western side of the dome, however undercutting is continuing and further pyroclastic flows are likely in this area.

Heavy rainfall for much of this week has generated several extensive lahars in the Belham valley, the largest occurring on 4 and 6 October.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been sixteen rockfall signals, two long-period, and two volcano tectonic and one hybrid earthquake recorded this week.

The average sulphur dioxide measurement on four days this week was 235 tons per day, with a maximum of 277 and a minimum of 208 tons per day. The fourier transform infrared ratio on 13 October was 0.38, similar to previous values obtained over past few months. In summary sulphur dioxide measurements are below the long term average but are stable.

The western side of the lava dome above Gages, immediately west of Chances Peak, remains unstable, undercut and overhanging areas are visible. A moderate sized pyroclastic flow with a runout of around 2 km was sourced from this region on 9 October. Further pyroclastic flows from this area of the dome are expected.

Light ashfall occurred in inhabited areas of Montserrat, mainly on 8, 9 and 10 October and was generated by rockfalls and pyroclastic flows.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been fifteen rockfall signals, one long-period and three volcano tectonic earthquakes recorded this week.

The average sulphur dioxide measurement on all seven days this week was 373 tons per day, with a maximum of 547 and a minimum of 181 tons per day.

The western side of the lava dome above Gages, immediately west of Chances Peak, remains unstable, undercut and overhanging areas are visible. The eastern side, above the Tar River Valley, is vertical in places. Pyroclastic flows could occur from these, and other, parts of the dome without any warning.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been eighteen rockfall signals, one long-period and eight volcano tectonic earthquakes recorded this week.

The average sulphur dioxide measurement on all 7 days this week was 275 tons per day, with a maximum of 376 and a minimum of 171 tons per day.

Cloudy weather has prevented good views of the lava dome this week. Sporadic rockfalls and pyroclastic flows are likely to occur from several unstable parts of the dome without any warning. Temperatures of pyroclastic flows deposits in the Trants and Spanish Point region formed on 11 February 2010 were measured this week, and were up to 120oC at 20 cm depth.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been seventeen rockfall signals, one long-period and one volcano tectonic earthquake recorded this week.

The average sulphur dioxide measurement on 6 days this week was 240 tons per day, with a maximum of 294 and a minimum of 169 tons per day.

Cloudy weather has once again prevented good views of the lava dome. The largest pyroclastic flow this week occurred during the early hours of 5 November. This travelled around 1.5 km down the Gages valley to the west of the volcano. Further pyroclastic flows are likely from several steep areas of the lava dome.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at the MVO website: www.mvo.ms.
Montserrat Volcano Observatory
Weekly Report for the period 5 to 12 November 2010

Activity at the Soufrière Hills Volcano has been low this week.

There have been nine rockfall signals, one hybrid and one volcano tectonic earthquake recorded this week.

The average sulphur dioxide measurement on 3 days this week was 466 tons per day, with a maximum of 601 and a minimum of 394 tons per day.

Small pyroclastic flows occurred in the Tar River valley on 6 November and from the northern side of the dome on 9 November, light ash fall occurred in inhabited areas of northern Montserrat associated with the latter event. Helicopter observations revealed the overhanging part of the dome on the western side, immediately east of Chances Peak has become enlarged by further undercutting and rockfalls and pyroclastic flows are therefore likely in the Gages valley.

Clear views this week have shown that incandescence (glowing) visible to the naked eye is present on the lava dome in several places. Some points of incandescence are visible at dusk before it is completely dark and indicates that areas of the dome, mainly fumaroles and fractures, are above 500 °C. This observation clearly indicates that despite the absence of lava extrusion over the last nine months parts of the lava dome remain hot. This incandescence is probably due to hot gasses passing through fractures in the dome from a deep source.

A small lahar occurred in the Belham valley on the morning of 7 November.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Montserrat Volcano Observatory

Weekly Report for the period 12 to 19 November 2010

Activity at the Soufrière Hills Volcano has been low this week.

There have been sixteen rockfall signals, twenty five long period and four volcano tectonic earthquake recorded this week. The long period events are not thought to be of a volcanic origin.

The average sulphur dioxide measurement on 3 days this week was 508 tons per day, with a maximum of 1089 and a minimum of 194 tons per day.

Small spots of incandescence, visible to the naked eye were observed from MVO on the evening of 12 November. The large unstable overhanging area on the western side of the lava dome remains and could collapse without any warning. Pyroclastic flows are therefore likely, particularly on the western side of the volcano.

A lahar occurred in the Belham valley and also other valleys around the volcano in the early hours of 13 November.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been nine rockfall signals, one long period, one hybrid and fourteen volcano tectonic (VT) earthquakes recorded this week.

Thirteen of the VT earthquakes occurred in a small swarm over ninety minutes on the morning of 26 November. This is the most intense VT swarm that has occurred since the pause in lava extrusion in February this year. Slight increases in fumarolic venting were visible following the swarm.

The average sulphur dioxide measurement on 7 days this week was 231 tons per day, with a maximum of 318 and a minimum of 126 tons per day.

The large unstable overhanging area on the western side of the lava dome remains and could collapse without any warning. Pyroclastic flows are therefore likely, particularly on the western side of the volcano.

A lahar occurred in the Belham valley on the morning of 23 November.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been twenty three rockfall signals, and eleven volcano tectonic (VT) earthquakes recorded this week. A small swarm of 8 VT events occurred over 25 minutes on the morning of 3 December, although several additional smaller VT events occurred that did not trigger the seismic network.

The average sulphur dioxide measurement on 7 days this week was 970 tons per day, with a maximum of 1444 and a minimum of 589 tons per day. This marked increase in sulphur dioxide output started on 26 November following the small VT swarm on that day.

Part of the large unstable overhanging area on the western side of the lava dome collapsed on 29 November generating pyroclastic flows that moved approximately 2 km down the western side of the volcano. The absence of the helicopter this week has prevented MVO from making detailed observations about the stability of the western side of the dome, however pyroclastic flows are still likely, particularly on the western side of the volcano. Small pyroclastic flows also occurred on the eastern side of the dome. Small spots of incandescence visible to the naked eye in the back wall of the 11February collapse scar on 2 December.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at the MVO website: www.mvo.ms.
Montserrat Volcano Observatory
Weekly Report for the period 3 to 10 December 2010

Activity at the Soufrière Hills Volcano has been low this week.

There have been nineteen rockfall signals, six long period and fourteen volcano tectonic (VT) earthquakes recorded this week. A small swarm of ten VT events occurred over 10 minutes on the morning of 8 December.

The average sulphur dioxide measurement on 7 days this week was 494 tons per day, with a maximum of 909 and a minimum of 296 tons per day.

A small pyroclastic flow occurred in the 11 February collapse scar around midday on 6 December. Helicopter based observations this week revealed that there is fresh rockfall and pyroclastic flow material, sourced from the eastern face of the dome, in the Tar River. Minor instability on several areas of the lava dome continues and further pyroclastic flows are likely.

A small lahar occurred in the upper part of the Belham valley on 7 December.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Montserrat Volcano Observatory

Weekly Report for the period 10 to 17 December 2010

Activity at the Soufrière Hills Volcano has been low this week.

There have been twenty seven rockfall signals and one long period earthquake recorded this week.

The average sulphur dioxide measurement on 7 days this week was 479 tons per day, with a maximum of 1519 and a minimum of 147 tons per day.

Several small pyroclastic flows occurred in the Gages valley this week on the western side of the volcano. The largest of which occurred on 15 December and travelled about 1.5 km. A small number of rockfalls also occurred in the 11 February collapse scar. Sporadic rockfalls and pyroclastic flows will continue to occur without any warning.

A marked steam plume was developed over the volcano on 14 and 15 December, but was not related to any detectable activity and is likely due to the meteorological conditions.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at can be found at the MVO website: www.mvo.ms.
Activity at the Soufrière Hills Volcano has been low this week.

There have been eleven rockfall signals recorded this week. Seismicity unrelated to volcanic activity associated with large sea swells has been recorded by the MVO’s seismic network over the past few days.

The average sulphur dioxide measurement over 6 days this week was 485 tons per day, with a maximum of 792 and a minimum of 343 tons per day.

A small pyroclastic flow travelled about 1.5 km down the Gages valley on the western side of the volcano on 19 December.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at the MVO website: www.mvo.ms.

MVO would like to wish everyone a very Merry Christmas.
Activity at the Soufrière Hills Volcano has been low this week.

There have been thirteen rockfall signals and one long period earthquake recorded this week. A number of these rockfalls or small pyroclastic flows have occurred in the 11 February 2010 collapse scar on the northern side of the volcano. However, low cloud has prevented any good observations of the lava dome this week.

Seismicity unrelated to volcanic activity associated with large sea swells has been recorded by the MVO’s seismic network once again over the past few days.

The average sulphur dioxide measurement over 7 days this week was 577 tons per day, with a maximum of 1127 and a minimum of 216 tons per day.

Lahars associated with heavy rain occurred in several valleys around the volcano on the evening of 30 December.

The Hazard Level is 3. There is no access to the terrestrial Zone C and daytime transit access to shipping through the maritime extension of the zone.

Additional information on the Soufrière Hills Volcano, the Hazard Level System and a glossary of volcanic terms can be found at the MVO website: www.mvo.ms.

MVO would like to wish everyone a successful 2011.