

EFFUSIVE ERUPTION AT LA SOUFRIÈRE VOLCANO, ST. VINCENT

SITUATION REPORT No. 5

AS OF 8:00 PM ON 9 FEBRUARY, 2021

Volcanic Activity Continues at La Soufrière, St. Vincent Alert Level Remains at Orange

LOCATION:

La Soufrière Volcano, Saint Vincent and The Grenadines

PRESENT ACTIVITY:

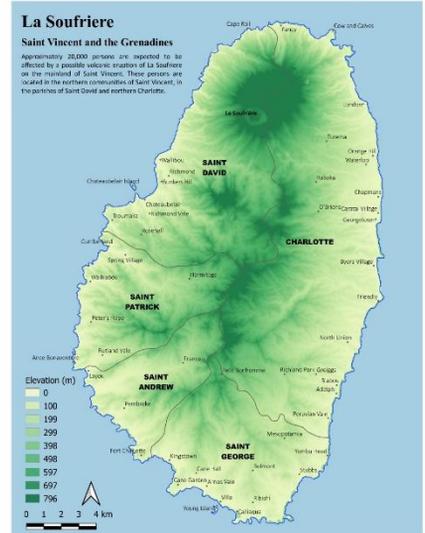
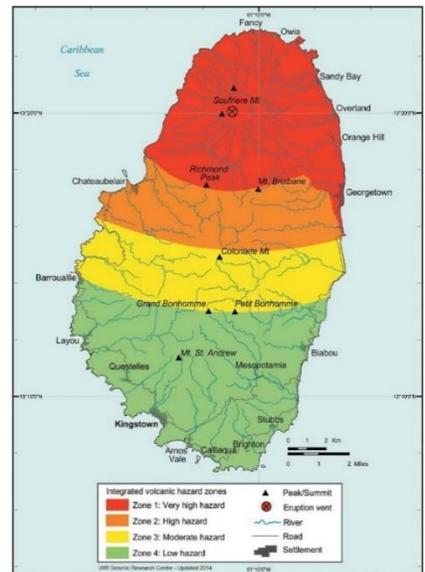
Effusive eruption, ongoing fumarolic activity, continued growth of the new volcanic dome, and increased seismic activity

ALERT LEVEL: ORANGE

SITUATION OVERVIEW

On 29th December 2020 the alert level for the La Soufrière volcano in St. Vincent and the Grenadines was elevated to **Orange** because of increased activity at the site. The volcano has had an effusive eruption, with visible gas and steam eruption and the formation of a new volcanic dome. The volcano continues to exude magma on the surface and gas emissions can be observed from the Belmont Observatory. A UWI Seismic Research Centre team is currently in St. Vincent to support monitoring and data collection and analysis.

An Orange Level alert means that there is highly elevated seismicity or fumarolic activity, or both, or other highly unusual symptoms. Eruptions may occur with less than 24 hours notice. Monitoring systems are continuously manned and there is regular visual inspection of potential vent areas as well as continuous ground deformation and hydrothermal monitoring.



**No Evacuation Orders
have been issued. Access to the
volcano is strictly prohibited.**

SITUATION cont'd

The UWI SRC advised that the new dome continued to grow with lateral spreading of ~15 m towards the north-west and south-east. The most active gas emissions were at the contact areas between the pre-existing 1979 dome and the 2020- 21 dome, as well as the top of the new dome. The fumarolic area on the old dome continued to be more active than prior to the eruption.

UWI SRC also indicated that based on the complex patterns of previous eruptions, it was too early to conclude that the current activity would remain a simple dome extrusion event as there was still a possibility of a shift to an explosive phase. UWI SRC noted that a definitive prognosis on the current unrest episode cannot be provided until further data analysis was completed. Satellite data obtained by various collaborating institutions confirm that the dome continues to grow.

On 1 February 2021, a team led by Dr. Thomas Christopher at the La Soufriere volcano took gas samples and installed equipment.

Dr. Christopher, Lead, Scientific Team, set up, deployed and retrieved volcanic gas samples from the volcano's new dome using filter packs.

The process included filters being dipped into a solution to cause the gas of interest to react with the relevant filter. Filters were then analyzed to detect the presence and concentration of magmatic gases such as Hydrogen Chloride (HCl), Hydrogen Flouride (HF), Hydrogen Sulfide (H2S) and Sulphur Dioxide (SO2).

Monitoring the chemistry of volcanic gases provides clues on how deep within the earth the gases were being emitted which can help scientists better understand how the eruption may unfold.

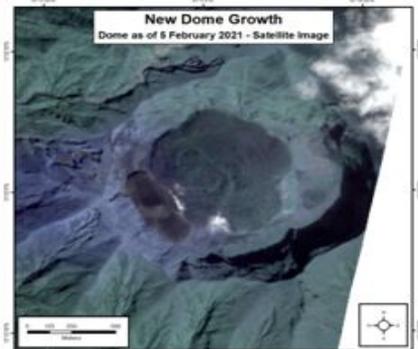
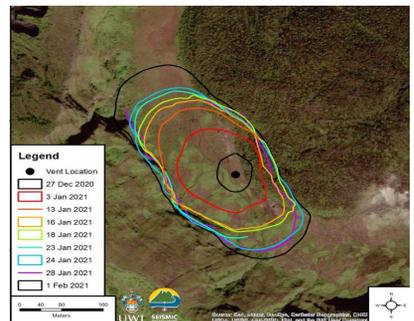


Photo credit: PlanetLabs
(Source: UWI SRC
<https://www.facebook.com/uwiseismic/photos/pcb.10157894607289327/10157894597579327>)



New lava dome footprint (surface area) derived from various sources including oblique photographs, aerial photogrammetry and satellite imagery. Image: UWI-SRC/MVO, Adam Stinton (Source: UWI SRC
<https://www.facebook.com/uwiseismic/photos/pcb.10157881880989327/10157881879939327>)



Photo credit: Monique Johnson. (Source: UWI SRC:
<https://www.facebook.com/uwiseismic/photos/a.112065204326/10157884528674327>)

Updates from Impacted CDEMA Participating State

The Caribbean Disaster Emergency Management Agency (CDEMA) has been in regular contact with the National Disaster Coordinator in St. Vincent and the Grenadines and the following was reported:



ST. VINCENT AND THE GRENADINES

1. NEMO's recent bulletins have advised that there was NO 'explosive' eruption at the La Soufrière volcano. La Soufrière continues to have effusive eruptions, as hot magma reaches the surface at extreme temperatures. This appears in the night as fire or a bright red glow above the crater. As the dome grows higher and closer to the rim of the crater this phenomenon will continue to be visible on clear nights.
2. The new dome continued to grow with lateral spreading of material towards the north and south, with a preferred northward growth observed.
3. Gas measurements were done using a Multi-Gas Instrument and a filter pack. The Multi-Gas measurements were successful and showed the presence of Sulfur dioxide (SO₂ gas coming from the volcano. The filter packs were used to measure gas species such as hydrogen chloride (HCl), Hydrogen fluoride (HF), Sulfur dioxide (SO₂) and Hydrogen Sulfide (H₂S) will need to be sent abroad for analysis.
4. Sulfur dioxide (SO₂) gas was detected in the eruption for the first time on Monday, February 1, 2021. The absence of Sulfur dioxide in the early stages of the eruption was due to the interaction of sulfur dioxide with the groundwater as the sulfur dioxide was dissolving in the groundwater. Since Sulfur dioxide (SO₂) gas was now coming out of the volcano, this suggests that the groundwater was drying up.
5. The camera installed at the summit of the volcano, on January 24 to monitor changes of the dome, was adjusted to allow clearer images to be received.
6. Four (4) GPS stations were currently streaming data to SRC.
7. The Belmont Observatory was now occupied permanently by the Lead Scientist and the monitoring network was being done on a 24-hour basis.
8. Damage to vegetation, from acidic gases emitted from the growing dome, downslope of the summit continued to be observed.
9. An investigation was conducted at the Wallibou Hot Spring area on Sunday 7th February, 2021 based on a report of irregular temperatures and unusual gas smells there. Gas sampling was done by Dr. Thomas Christopher, the temperature was taken at different points and some liquid samples were collected for further analysis.
10. The deformation network was functional. Successful hits of the Electronic Distance Measurement (EDM) target were recorded on the volcano rim from Richmond Vale, Troumaca, Rose Hall, Belmont, and Cherry Hill Chateaubelair. Base line data was being collected. The EDM Network is used to assist with measurements of deformation associated with the flanks of the volcano.
11. NEMO continued to remind the SVG public that no evacuation order or notice had been issued.
12. NEMO continued to appeal to the public to desist from visiting the La Soufrière Volcano, especially going into the crater, since doing so was extremely dangerous.

The effusive eruption at the La Soufriere volcano SVG continues and as the scientists study the new dome, UWI SRC shared the following infographic to help persons to better understand the activity and what is being done to monitor the volcano.

(Source: UWI SRC <https://www.facebook.com/uwiseismic/photos/a.112065204326/10157887300554327/>)

LA SOUFRIÈRE'S NEW DOME

ST. VINCENT

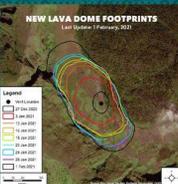
DOMES FORMING ERUPTIONS AT LA SOUFRIÈRE

According to historical accounts, lava domes have formed at least **4** in the recent past.

1780 1880 1971 1979

DOMES GROWTH

Dome volume has increased steadily since lava broke the surface of the crater floor in late December 2020. Based on preliminary data as of 1 February, 2021, the dome is estimated to be 510m length, 230m width and 90m height and 5.93 million m³ total volume. This may change as additional data is obtained.



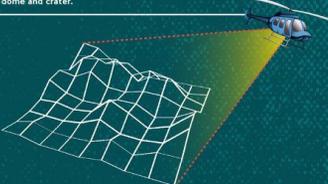
LOCATION

The new "satellite" dome sits wedged between the crater wall and the south-western corner of the 1979 dome.



PHOTOGRAMMETRY

Scientists use a technique called photogrammetry to measure the size of the dome. Aerial photos are used to build accurate 3D models of the dome and crater.



HAZARDS

Volcanic gasses released by the dome can burn vegetation and cause breathing discomfort for anyone close by. Carbon dioxide is a colourless, odourless gas that can be deadly in high concentrations near the crater. Rockfalls may also occur as the dome continues to grow. **PUBLIC ACCESS TO LA SOUFRIÈRE IS STILL RESTRICTED AT THIS TIME.**



FUTURE ACTIVITY

Based on previous eruptions, the dome may continue to grow, stop and then return to background levels or an explosive eruption may occur. Persons need to be prepared for any eventuality and listen to official sources of information.









@uwiseismic
@nemosvg



THREAT LEVELS

Below is a summary of the threat alert levels for the La Soufriere volcano:

LA SOUFRIERE VOLCANO HAZARD ALERT LEVEL

Alert Level	Symptoms	Action Scientist	Action: Civil Authorities
Green	Volcano is quiescent (quiet): seismic and fumarolic (steam vent) activities are at or below the historical level at this volcano. No other unusual activity has been observed.	Normal monitoring	Undertake ongoing public awareness campaign and work on volcanic emergency plans.
Yellow	Volcano is restless: seismic or fumarolic activity or both are above the historical level at this volcano or other unusual activity has been observed (this activity will be specified at the same time that the alert level is raised).	Monitoring system will be brought up to full capability. Civil authorities alerted.	Undertake ongoing public awareness campaigns and work on volcanic emergency plans. Advise vulnerable communities of evacuation procedures in the event of an emergency.
Orange	Highly elevated level of seismicity or fumarolic activity or both or other highly unusual symptoms. Eruptions may occur with less than 24 hours notice.	Monitoring system continuously manned. Regular visual inspection of potential vent areas. Continuous ground deformation and hydrothermal monitoring. Daily assessment reports to civil authorities.	Coordinate evacuation (if necessary) based on hazard zones. Entry to the restricted access zone by scientist will be permitted after evacuation on a case-by-case basis. Organize regular radio and television announcements.
Red	Eruption is in progress or may occur without further warning	Measurements as permitted by safety condition. Civil authorities advised continuously.	Coordinate continued evaluation as necessary. Organize regular radio and television announcements.

Caribbean Disaster Emergency Management Agency (CDEMA) Actions

The CDEMA Coordinating Unit (CU) continues to operate in accordance with the Standard Operating Procedures (SOPs) of the Regional Coordination Plan (RCP) which includes maintaining contact with the threatened states and its Regional Response Mechanism (RRM) partners.

CDEMA's actions to date:

- I. The CDEMA Coordinating Unit continues to undertake technical consultations with the UWI Seismic Research Centre (SRC) on the status of La Soufriere volcano.
- II. The Regional Coordination Plan (RCP) was activated at 6:00 PM December 29, 2020.
- III. The Volcano Response Plan, the Regional Coordinating Centre (RCC), the Regional Logistics Plan (RLP) and the Regional Response Mechanism were activated.
- IV. The CDEMA Coordinating Unit (CU) undertook consultations with the National Disaster Coordinator of the Subregional Focal Point in Barbados remained ready to provide support.
- V. In accordance with the Volcanic Annex of the RCP, the following Regional Response Mechanism (RRM) Teams have been placed on ALERT:
 - a) CARICOM Disaster Assessment and Coordination (CDAC)
 - b) CARICOM Operational Support Team (COST)
 - c) Rapid Needs Assessment Team (RNAT)
 - d) Caribbean Disaster Relief Unit (CDRU)
 - e) Regional Urban Search and Rescue Teams (RSART)
- VI. The CDEMA CU was in constant contact with the SVG NDO and was providing technical assistance to the SVG National Emergency Management Organisation (NEMO) by testing the Emergency Telecommunications between the CDEMA CU, SVG, SRFP (Barbados and the Participating States; also Volcano Hazard Emergency and Logistics Planning and the GeoCRIS mapping – with support from the Copernicus Emergency Mapping Service (EMS).
- VII. The CDEMA CU was providing technical assistance to the SVG National Emergency Management Organization (NEMO) in the following areas:
 - a) Evacuation Planning
 - b) Logistics Planning
- VIII. The CDEMA CU convened a Brief and Table-Top Exercise (TTX) on the revised SVG Volcano Emergency Plan & SOP document on Friday, January 29, 2021.

Caribbean Disaster Emergency Management Agency (CDEMA) Actions

- IX. The Core-Coordination Group on Volcanic Hazards (CCG-VH), established as a thematic coordinating cell of the Regional Coordination Centre, was convened twice since January 2021. The CCG-VH, which comprises key representatives of political, scientific and technical institutions in the region, agreed to undertake the following:
- a) To work in support of the National Disaster Office of the threatened or impacted State, under the scientific guidance of the UWI Seismic Research Centre or other designated scientific entity, and
 - b) To provide guidance for the provision of regional and international assistance to affected populations, with a focus on preparedness actions to address possible effects/impacts of the volcanic hazard.
- X. A meeting of the Caribbean Development Partners Group (CDPG) was convened on Thursday January 28th, 2021. The date of the next meeting of the CDPG would be circulated to the group.
- XI. The CU would continue to monitor the situation in collaboration with the UWI Seismic Research Centre, the St. Vincent and the Grenadines NEMO and the National Disaster Management Offices of Participating States in close proximity to the volcano, and provide updates to the RRM partners as necessary.

The CDEMA CU urges all Participating States and members of the RRM to monitor the progress of this volcanic event. The public should continue to monitor the releases from their local National Disaster Management Office.

List of preparatory actions being undertaken by the RRM Partners



LOGISTICS SUPPORT

- The World Food Programme (WFP) was able to provide technical support for transportation planning and mapping to determine where logistics hubs could be set up if needed, as well as the projected costs for Feeding options for the operational planning and the cost planning.
- Support provided by the RSS via Air Wing and C26 Aircraft, French Military support via rotary winged aircraft and 7- day contracted support of CalvinAir Helicopters provided through CDEMA and the UK FCDO.



AGRICULTURE & FOOD SECURITY

- The UN Food and Agriculture Organisation (FAO) was supporting the Ministry of Agriculture to include the preparedness protocol development for crops; these protocols were endorsed by the Ministry. FAO were currently helping to identify animal evacuation routes, animal emergency shelters, storage facilities and alternative livelihoods for farmers and fisherman.
- The Caribbean Agricultural Research and Development Institute (CARDI) was providing support towards agricultural planning.



SECURITY

- An Regional Security System (RSS) Warning Order had been issued to its Member States to standby for deployment if requested by the impacted State.



RELIEF SUPPORT

- UNICEF pre positioned supplies (water containers, purification tables, sanitisation supplies etc.) in Antigua, Barbados and Trinidad and Tobago. They stand ready to support any other areas via cash or non-food items.

List of preparatory actions being undertaken by the RRM Partners cont'd

GENERAL COORDINATION

- The International Federation of Red Cross (IFRC) and Red Crescent Societies (RCS) remains in contact with NEMO and the St. Vincent Red Cross Society and is on standby to provide assistance as requested.
- The Caribbean Development Bank (CDB) has expressed its commitment to support the Government of SVG and CDEMA, and is on standby to provide assistance following formal requests..
- The World Bank (WB) Group was on standby to provide technical support and guidance in financial economic planning to SVG.
- The United States Agency for International Development (USAID) Bureau for Humanitarian Assistance (BHA) Volcano Disaster Assistance Programme (VDAP) donated three seismic stations to the Government of St. Vincent and the Grenadines. The stations, which would be installed by UWI SRC, included sensors, radios, cables and solar panels. Additional equipment to be provided at a later date.
- The Copernicus Emergency Mapping Service (EMS) provided a satellite map which showed the transportation network, built up areas/buildings, river network and interferometric (synthetic aperture radar/ SAR) imagery.