

Anticipatory Actions in the 2020–2021 Eruption of La Soufrière, St. Vincent: Lessons for EW4All



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EW4ALL WORKSHOP 2025 – Geneva

Overview

- **Setting and Context: geological, monitoring, response**
- **Long term capacity building efforts**
- **Collaborations and Multidisciplinary efforts**
- **Operational challenges during the eruption**
- **Future considerations**





The UWI Seismic Research Centre

Primary source of information for earthquakes and volcanoes in the English-speaking Eastern Caribbean with the largest geophysical network of >60 stations in the region.

Provide services and expert advice to 9 territories that host 17 of the region's 21 volcanoes. **Role in the multi-hazard early warning systems**

Support disaster management agencies with public education efforts.

Conduct research on geological processes in the region.

Monitor

Earthquakes, volcanoes and tsunamis



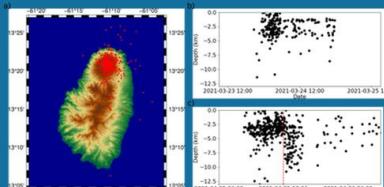
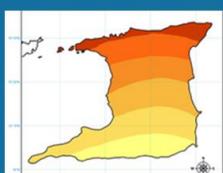
Research

Improve understanding of earthquakes, volcanoes and tsunamis and their effects



Mitigate

Provide the contributing territories with information and advice on geologic hazards

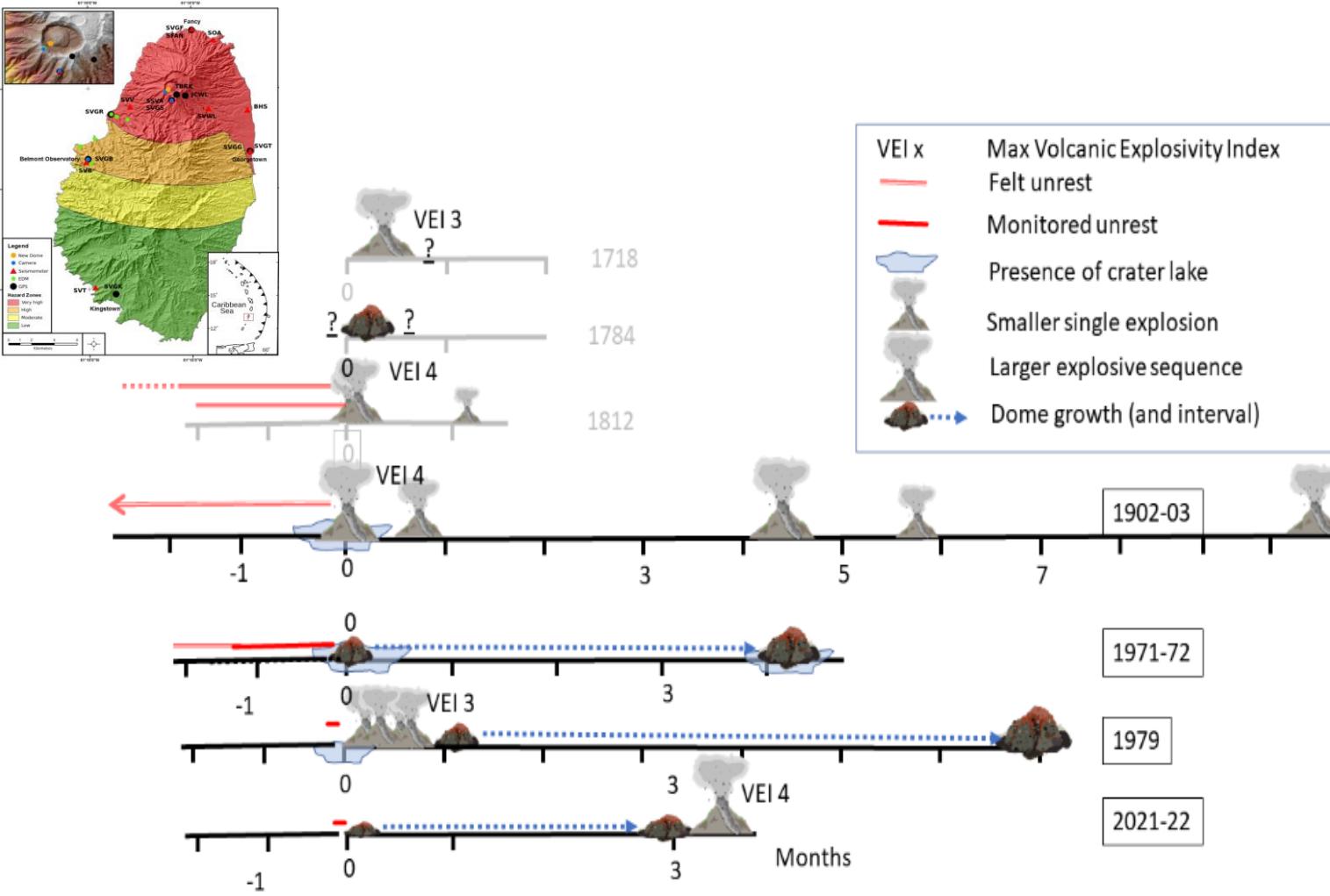


Educate

Increase public awareness and understanding of the geohazards monitored



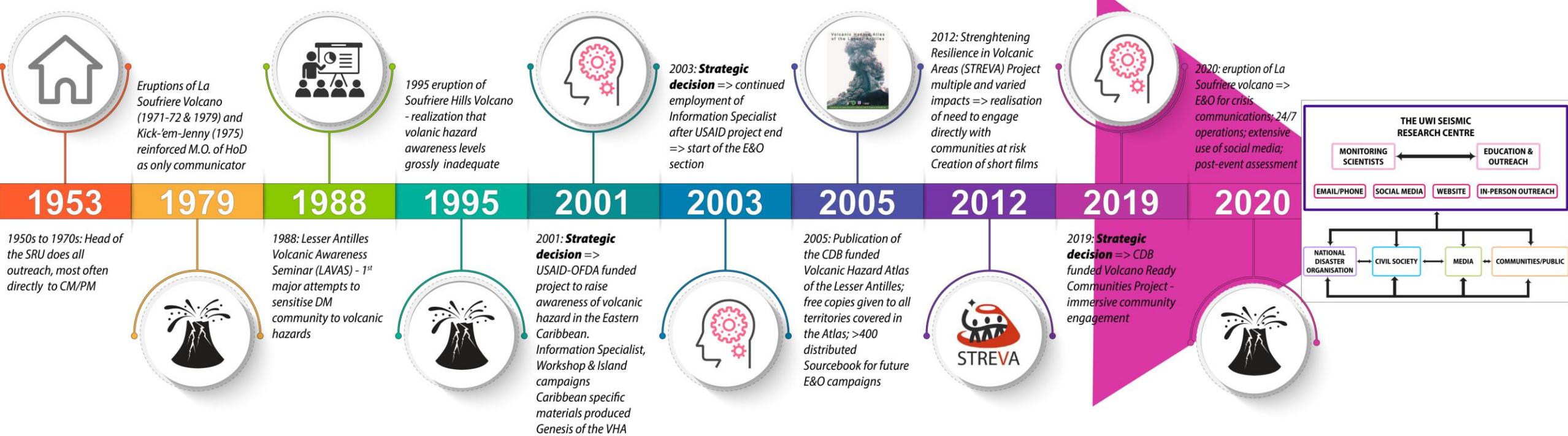
La Soufrière volcano, St. Vincent: historical activity



Timeline of historical eruptions of La Soufrière, St Vincent variance in styles, duration and timing of activity relative to ambient conditions, and recorded geophysical precursors (Barclay et al., 2022).

- Mainly scoria-flow type PDCs with fallout
- Explosive: 1440, ~ 1580, 1718, 1812, 1902, 1979, 2020-21
- Effusive: 1784, 1971-72
- Repose period ranging between 77 & ~140 years & systematically decreasing in more recent times
- ~1440 & 1580 CE eruptions produced magmatic lapilli fallout + PDCs
- 1812 & 1902 ash-rich, possibly phreatomagmatic at onset
- Narrow compositional range for all magmas: mainly basaltic andesites

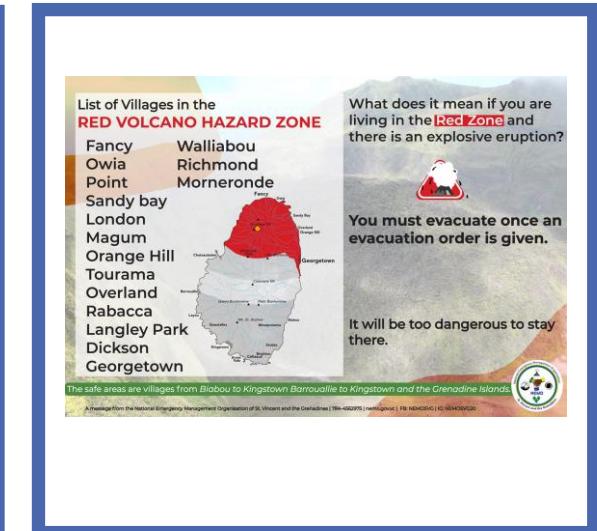
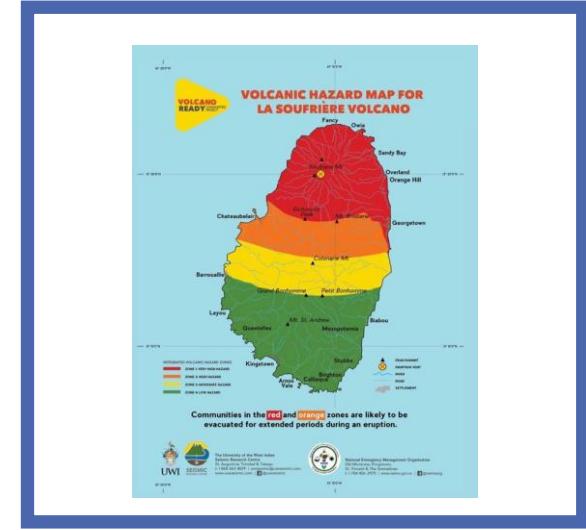
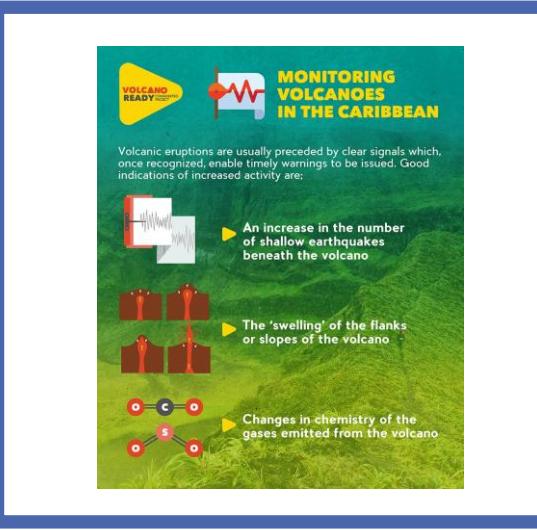
Education and Outreach



Long term DRRM engagement

Pre-eruption:

- >10 years of “Volcano Awareness Week”
- Update of Hazard Map
- Updating of Volcanic Emergency Plan (incl. evacuation planning) in 2014
- Testing of plan – Exercise Tradewinds 2019
- Community Engagement – ‘Volcano Ready Communities Project’
- Shelter assignment of communities





Implemented by The UWI SRC through CDB Grant Funding accessed from the Community Disaster Risk Reduction Fund

Project Value USD\$618,700.00 Start: April 2017 End: April 2021

TO REDUCE VULNERABILITY TO THE MULTI-HAZARD ENVIRONMENT OF THE LA SOUFRIERE VOLCANO

- ▶ Enhance community-specific emergency response procedures
- ▶ Increase capacity of residents to plan, prepare and respond to emergencies due to volcanic and other hazards
- ▶ Strengthen community knowledge and awareness

OUTPUTS

- ▶ Volcano Ready Framework Developed including Draft Hazard Maps
- ▶ 4 Community Emergency Response Plans (CERP) Drafted
- ▶ Protocols and Simulations Developed for CERP
- ▶ Vulnerability & Capacity Assessments Conducted
- ▶ 12 CERT Teams trained and equipped across project communities
- ▶ 12 Community Emergency Warehouses stocked with essential response equipment, tools and supplies
- ▶ 4 targeted Community Awareness Campaigns conducted engaging over 1200 persons
- ▶ Capacity building training conducted for community volunteers



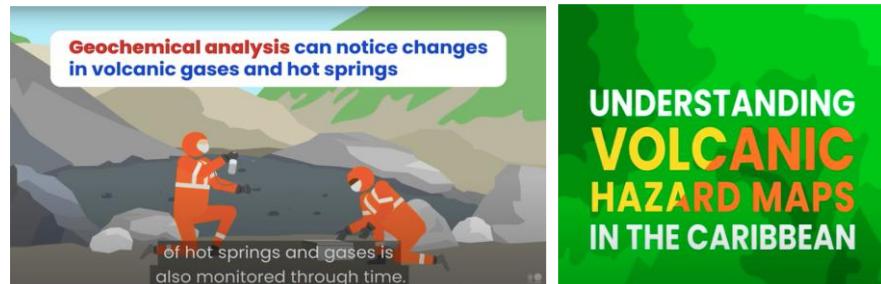
BILLBOARDS



POSTERS



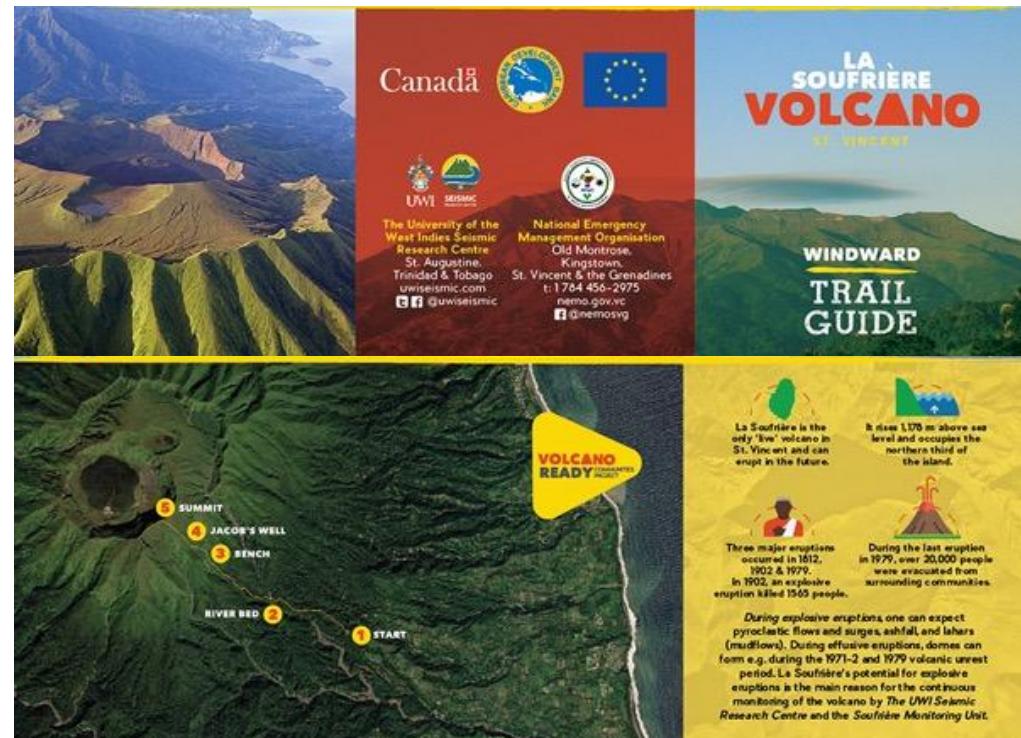
ANIMATIONS



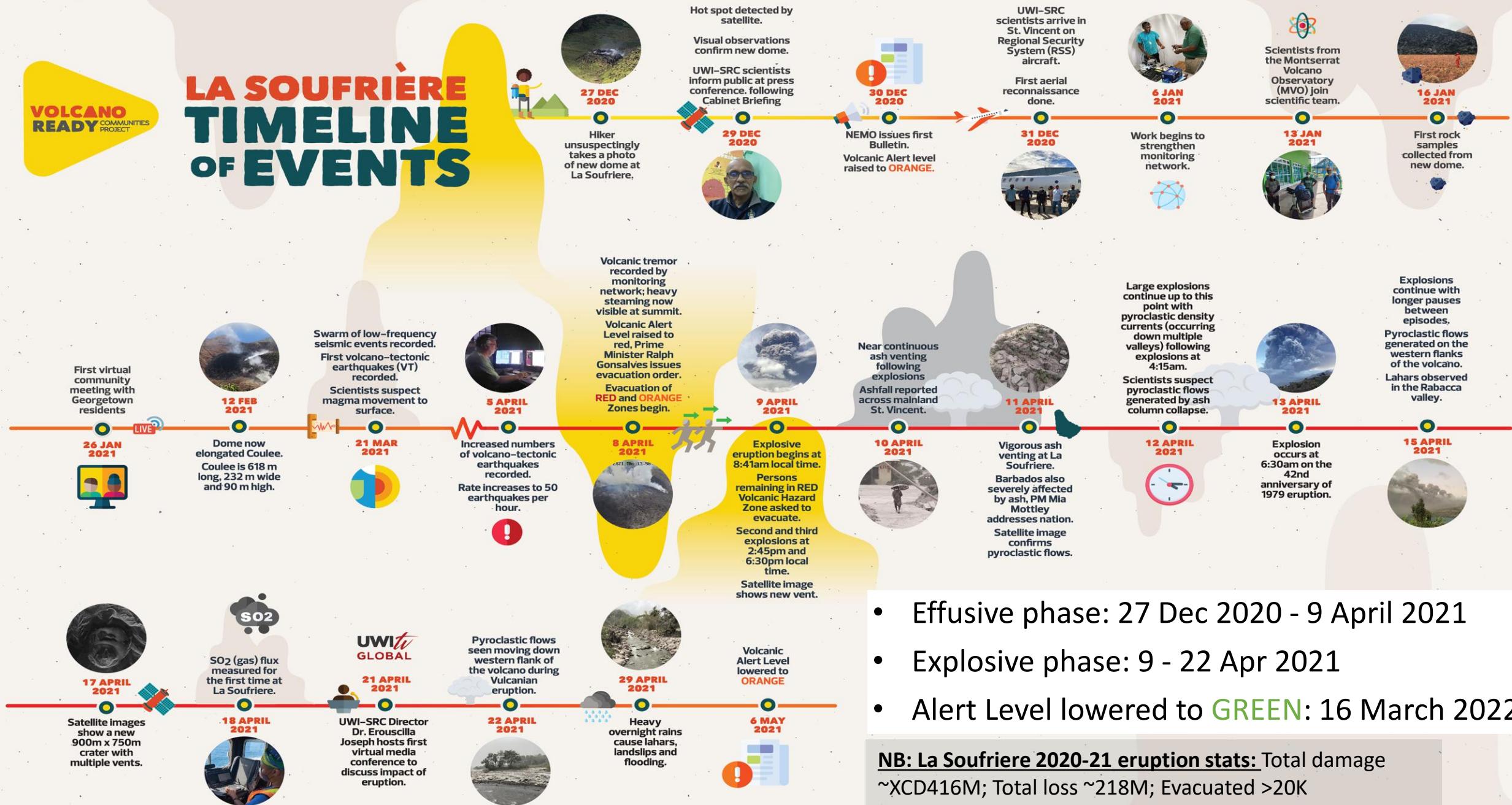
TEACHING TOOLS



TRAIL GUIDES



LA SOUFRIÈRE TIMELINE OF EVENTS

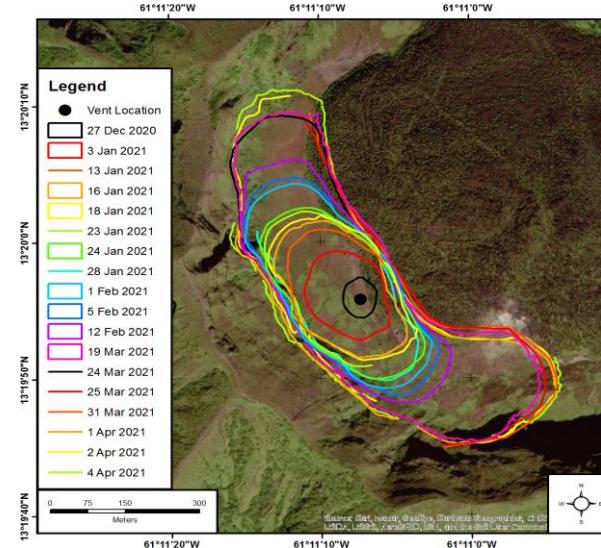


- Effusive phase: 27 Dec 2020 - 9 April 2021
- Explosive phase: 9 - 22 Apr 2021
- Alert Level lowered to **GREEN**: 16 March 2022

NB: La Soufrière 2020-21 eruption stats: Total damage ~XCD416M; Total loss ~218M; Evacuated >20K
PDNA La Soufrière Volcanic Eruption, August 2021

UWI SRC response to the eruption

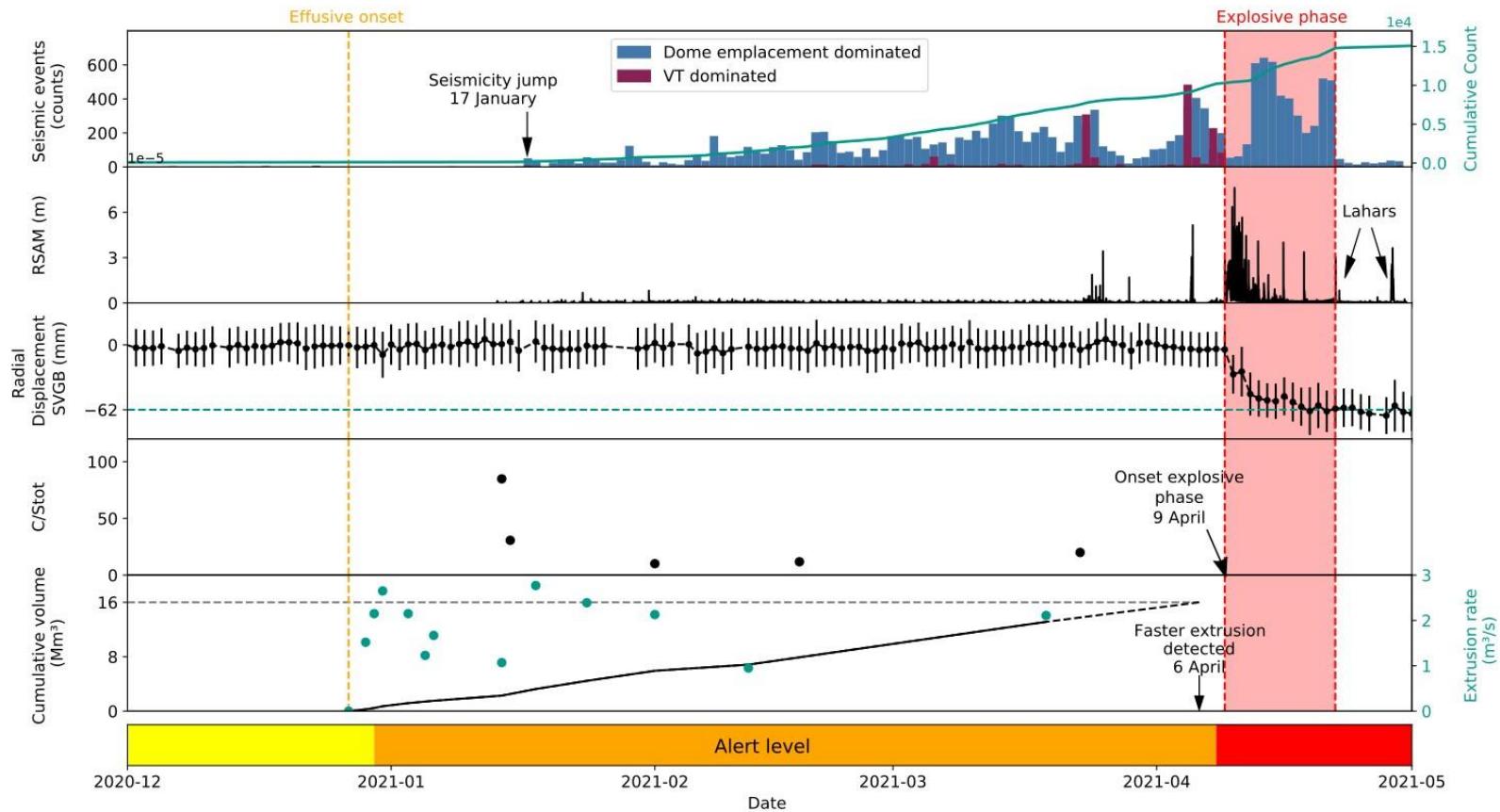
- Strengthen monitoring network and conduct hazard and risk assessments
- Work closely with the National Disaster Coordinator to coordinate monitoring efforts
- Participate in public and virtual town-hall meetings on St. Vincent
- Conduct other essential scientific fieldwork: rock, gas sampling, GPS, InSAR, thermal, UAV
- Provide regular advisories and briefings to a large body of decision-makers
- Data Integration for Early Action
- Respond to media inquiries, develop and implement a social media program to provide public awareness and reporting on ongoing activity: multi-platform public engagement



Decision-Making Under Uncertainty

Recognising
eruptive
transitions

Timely evacuation
guidance (24–48h
window)



Cascading Hazards and Multi-sector Impacts



Explosions, PDCs, ashfall,
gas, lahars



Multi-hazard interactions
and cascading impacts

Response by Civil Authorities



NEMO – Coordination Agency

- Operationalized the local observatory
- Finalization of evacuation plan
- Activation of NEOC
- Public Information
 - “Living with the volcano” radio program
 - “Roundtable Talk” TV program
 - Dissemination of ‘Volcano Ready Project’ outreach materials
 - Virtual meetings
 - Drive-through meetings
 - Daily radio program during explosive phase

NEOC Established

- Transportation Plan
- Maintenance
- Mobilization of resources: local & regional
- Evacuation: Leeward, mainly via sea
Windward – via land
- Shelter Operations: assignment of communities to emergency shelters
- Shelter management – personnel, health and sanitation
- Call Centre Operation
- Shelter feeding plan



Eyeing La Soufrière NORTH LEeward

VIRTUAL MEETING

Tuesday March 2, 2021
6:00 PM (Eastern Caribbean/AST)

Dr. The Hon. Ralph Gonsalves
Prime Minister
Saint Vincent and the Grenadines

Ms. Michelle Forbes
Director
National Emergency Management Organisation (NEMO)
Saint Vincent and the Grenadines

Dr Thomas Christopher
Volcanologist
The UWI Seismic Research Centre
Montserrat Volcano Observatory (MVO)

Update on volcanic activity | **Q&A with Scientists and Emergency Management Experts** | **Update on evacuation plan and safety measures for North Leeward**

The National Emergency Management Organisation (NEMO) Announces:

Volcano Awareness Drive Through

Tuesday 16th February, 2021

Come hear updates on:
The state of La Soufrière volcano
Individual preparedness
Evacuation procedures

START TIME: 5PM

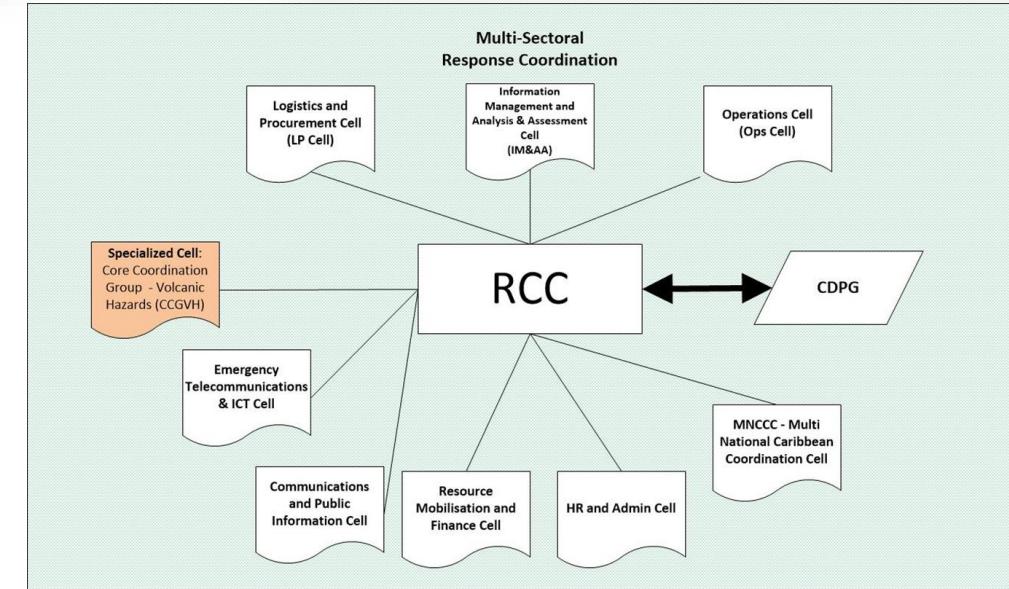
A message from the National Emergency Management Organisation of St. Vincent and the Grenadines | PB-NEMO/2021-02-16/000000

Troumaca



Regional Response Mechanism

- ❖ CDEMA functions 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.
- ❖ The Core-Coordination Group on Volcanic Hazards (CCG-VH) was established as a thematic coordinating cell of the Regional Coordination Centre
- ❖ CDEMA meetings with the Caribbean Development Partners Group (CDPG) to coordinate actions and provide updates, secure funding and support
- ❖ CPG Meetings held daily
- ❖ 31 Situation Reports
- ❖ Savingram to the CDEMA Participating States



Deployment Teams & Logistics Support

CDEMA technical support to EOC



RFA Wave Knight delivering relief items from Barbados to St. Vincent



Arnos Vale Logistics Hub

Post eruption damage assessment



Through funding from the UK FCDO over 30 emergency response team members were deployed



CARICOM Operational Support Team (COST) provided direct emergency operational support to the national EOC



Facilitated the review and update of SOPs, and plans and tested these SOPs via two war-gaming exercises



CARICOM Disaster Relief Unit (CDRU): Establishment and operation of the Arnos Vale logistics hub in partnership with the WFP assisting with relief management



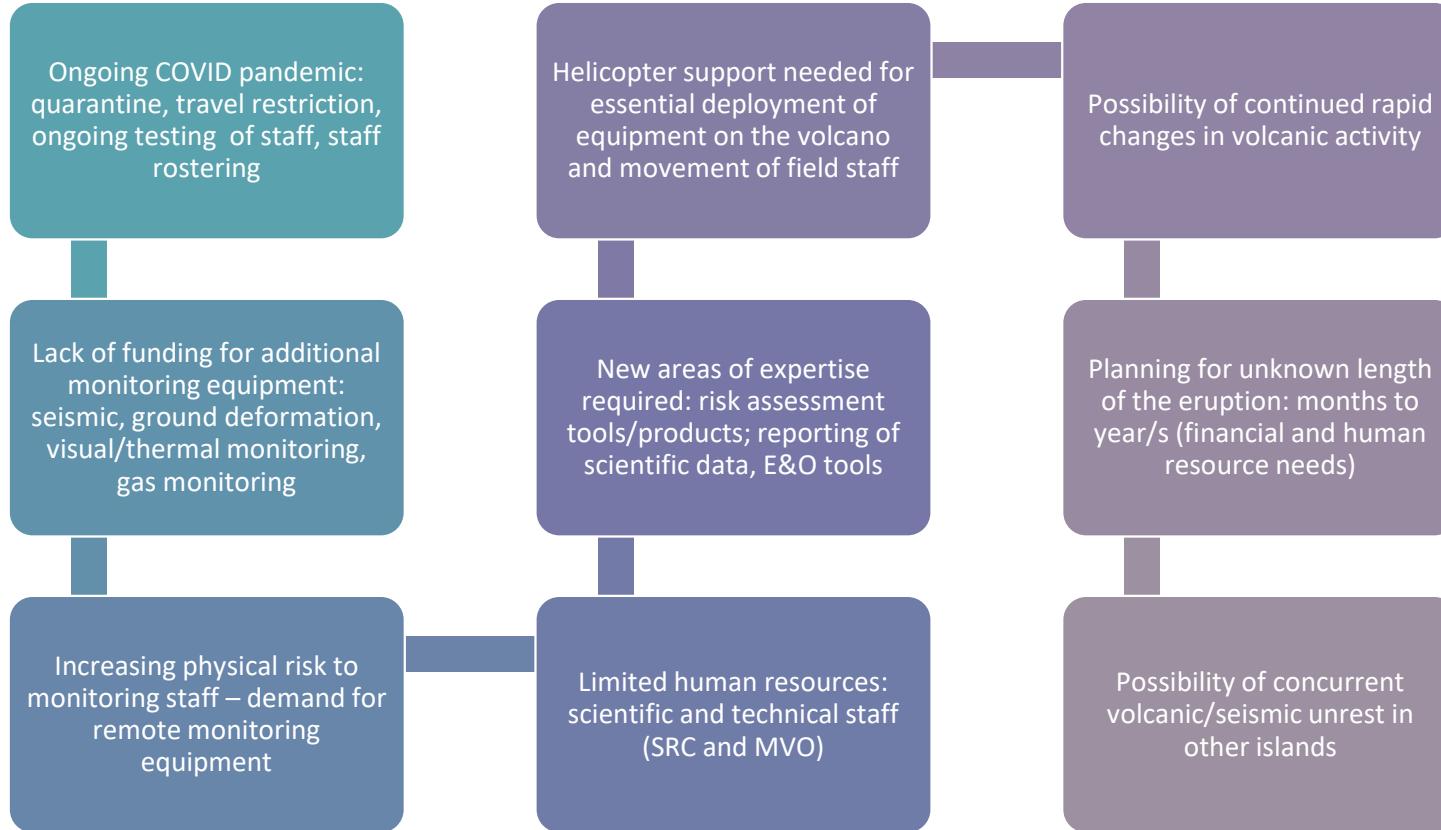
Detailed Damage Sectoral Analysis (DDSA)



Coordinated direct monetary donations to relief efforts

Conducted a rapid in-depth analysis of the damage done by the volcanic eruption to water, health, agriculture and other sectors

Challenges with responding to the ongoing eruption



The 2020–21 Eruption of La Soufrière Volcano, St Vincent

Edited by

R.E.A. Robertson, E.P. Joseph, J. Barclay and R.S.J. Sparks



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Lessons: Aligning with EW4All Pillars

Risk Knowledge

Knowledge/experience of past events

Experienced team on the ground (leadership & experience)

Monitoring, Analysis and Forecasting

Multi-parametric dataset in anticipating course of eruption
Evolving emergency plans and procedures

Warning Dissemination & Communication

Ongoing engagement with regular scientific updates & trusted voices

Preparedness and Response

Planning, preparedness & engagement
Teamwork and partnerships (national and international)

TAKEAWAYS FOR GLOBAL APPLICATION

Partnerships
=>
Opportunities

Be Strategic =>
Predetermined
priorities

Ensure bases
are covered

Work with
DMAs =>
Teamwork

Build Trust
with
Community

Engagement
=> Listen &
Learn

Post eruption Community Engagement

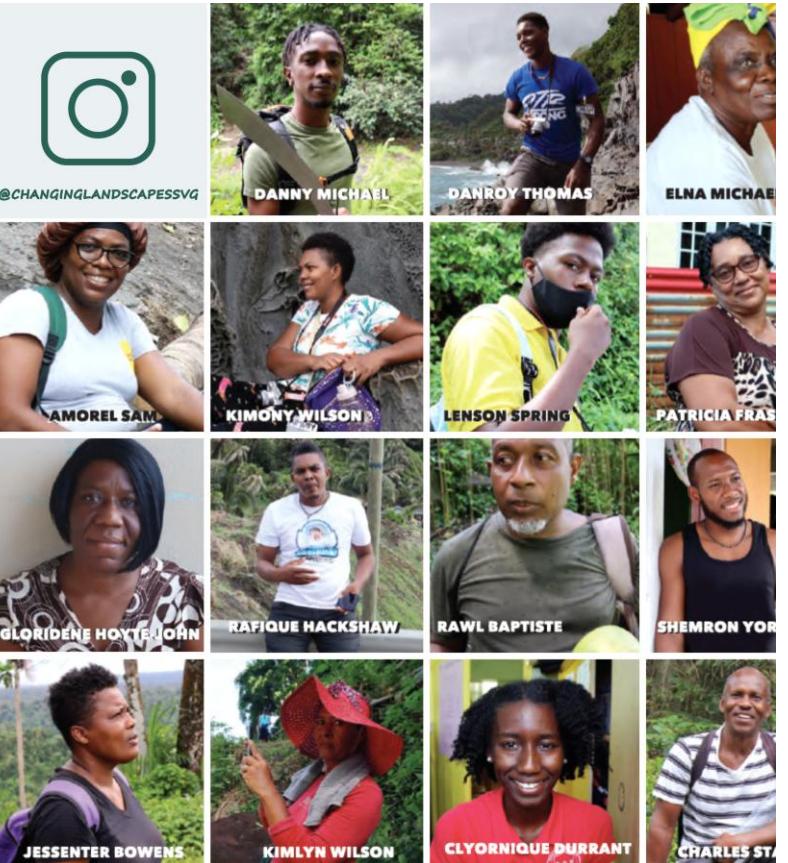
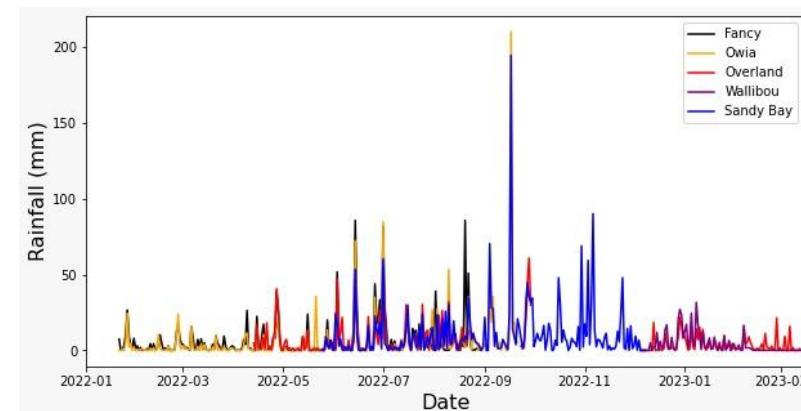


Photo was taken by Danroy Thomas during the Changing Landscapes SVG project



Photo was taken by Elna Michael during the Changing Landscapes SVG project



‘Risk at the Margins’ (RAM) => Changing landscapes project =>
Community-hosted Rain gauges



Capacity building

- Need to **support and build upon existing, competent regional institutions with proven ability**
- Need to mobilize & make visible the expertise of communities in strengthening resilience
- Institutional and technical capacity building (as a means of **strengthening disaster risk governance & financial resilience**) is critical
- Need for a fundamental shift to comprehensive all-hazards disaster risk management
- Need for balance in perspective between climate change and hydro-meteorological events and geophysical hazards
- Development, legislation and enforcement of land-use, building regulations and codes





UWI **SEISMIC**
RESEARCH CENTRE

SEVEN DECADES & MORE WORKING TO
PROTECT CARIBBEAN PEOPLE



Thank you

The UWI-SRC is the official agency responsible for monitoring earthquakes, volcanoes and tsunamis in the English-speaking Eastern Caribbean.

Follow us on social media @uwiseismic

Visit our website at www.uwiseismic.com

**SAVE
THE
DATE**
14-18 JULY 2025
MONTSERRAT



Join Our E-Mail List
Please email us your name and
email address if you are interested
shvinfo@mvo.ms