



Area of Interest: Fentale Volcano, Ethiopia
Date Covered: 15 February – 11 March 2025
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Purpose/Caveats: This event response report was produced to assist situational awareness and rapid response efforts. It represents best endeavours at the time of issue. Analysis and interpretation of the data is preliminary, which may not reflect the most up-to-date or complete information due to the evolving situation.

Data Used:

- InSAR images collected by the European Sentinel-1 satellite and processed using the COMET LICsAR system (<https://comet.nerc.ac.uk/comet-lics-portal/>)
- USGS Earthquake Catalogue (<https://earthquake.usgs.gov/earthquakes/search/>)

Plain language summary:

After the slowdown in dyke opening reported from late January to mid-February, Sentinel-1 interferograms show a reopening of the dyke in late February. We have interpreted this as a short pulse of magma that intruded into the dyke with a subsequent ongoing slowdown over a 24-day period.

Recent Activity:

Reopening and slowdown in dyke intrusion

We previously reported a slowdown in dyke opening based on Sentinel-1 images acquired on 15 February (refer to Event Response Report 1.7). Since then, there has been another pulse of magma intrusion, with an increase in dyke opening (~25 cm line-of-sight displacement) observed between 15-27 February before slowing down in the following 12-day period from 27 February to 11 March with ~5 cm LOS displacement (Fig 1). This is accompanied by a correlated increase in subsidence beneath Fentale and subsequent decrease. This pulse (reopening over ~12 days) was much shorter than the previous one which lasted approximately from 17 December 2024 to 15 February 2025. During the period of 15 February to 27 February, USGS reported six > M4 earthquakes.

As of 8 March, plumes along the eastern wall of the caldera and over the central vent continue to be visible in satellite optical imagery (Sentinel-2 and Planet). Thermal anomalies were last detected on 6 March by MIROVA with VIIRS imagery.

Forward Look:

Since 27 February, there have been no further > M4 earthquakes reported by the USGS at the time of writing.

We will continue to monitor surface deformation with the upcoming Sentinel-1 and COSMO-SkyMed images. This, in combination with other data, observations and models, will provide evidence on which the potential evolution of the event can be considered. A scientific committee comprising scientists from Addis Ababa University (IGSSA and School of Earth Science), the Geological Institute of Ethiopia and other relevant institutions is monitoring the events and keeping the Ethiopian Disaster Risk Management Commission (EDRMC) and the public continuously informed. The government has reminded citizens to follow precautionary messages given by professionals.

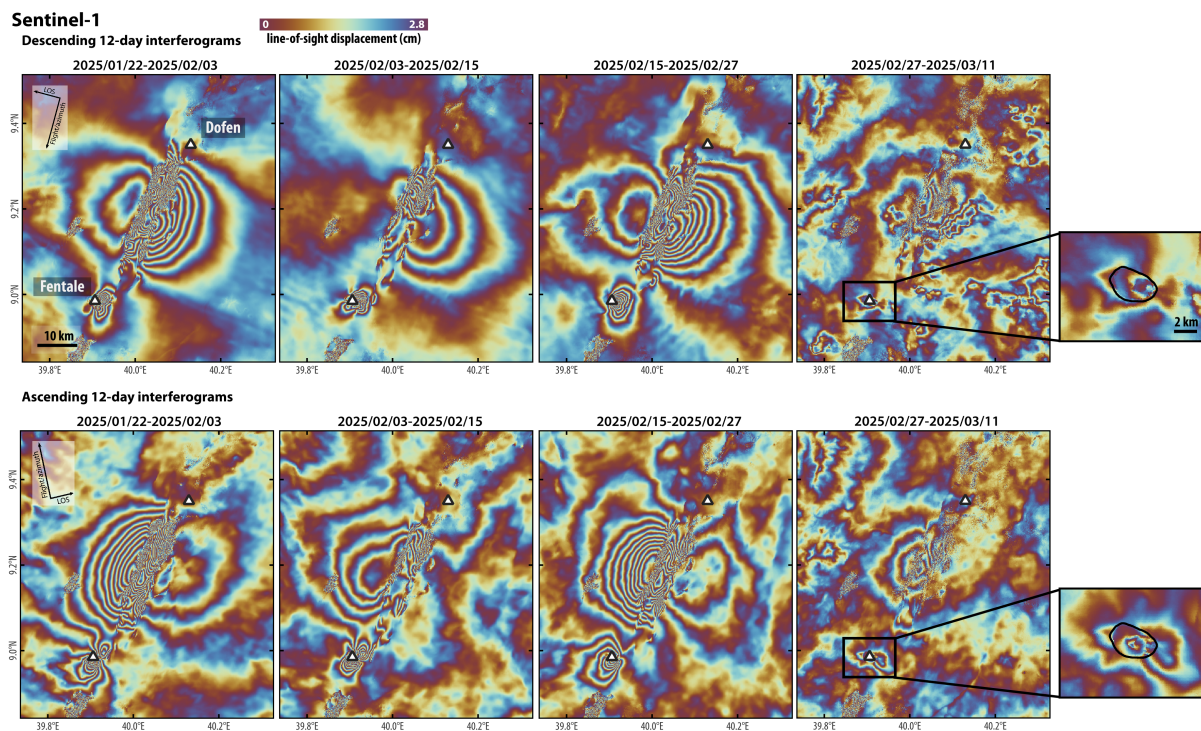


Fig 1. Latest intrusion pulse, shown by dyke reopening (3rd column: 15-27 Feb) and slowdown (4th column: 27 Feb – 11 Mar) in consecutive 12-day Sentinel-1 interferograms. Dyke reopening is accompanied by increased subsidence beneath Fentale, and slowdown with reduced subsidence.