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Effusive Crises at Piton de la Fournaise 2014-2015: A Multi-National Response Model

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Many active European volcanoes and volcano observatories are island-based and located far from their administrative “mainland”. Consequently, Governments have developed multisite approaches, in which monitoring is performed by a network of individuals distributed across several national research centers. At a transnational level, multinational networks are also progressively emerging. Piton de la Fournaise (La Réunion Island, France) is one such example. Piton de la Fournaise is one of the most active volcanoes of the World, and is located at the greatest distance from its “mainland” than any other vulnerable “overseas” site, the observatory being 9365 km from its governing body in Paris. Effusive risk is high, so that a well-coordinated and rapid response involving near-real time delivery of trusted, validated and operational product for hazard assessment is critical. Here we report how near-real time assessments of lava flow propagation were developed using rapid provision, and update, of key source terms through a dynamic and open integration of near-real time remote sensing, modeling and measurement capabilities on both the national and international level. The multi-national system evolved during the five effusive crises of 2014-2015, and is now mature for Piton de la Fournaise. This exercise allows us to identify strong and weak points of the existing system, and demonstrates that enhanced multi-national integration at European level can have fundamental implications in scientific hazard assessment and response during an on-going effusive crisis.