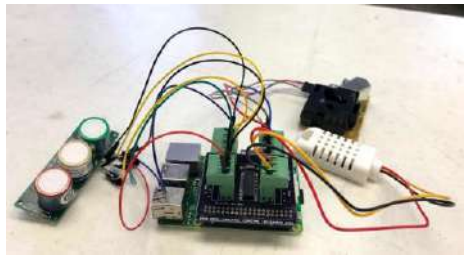
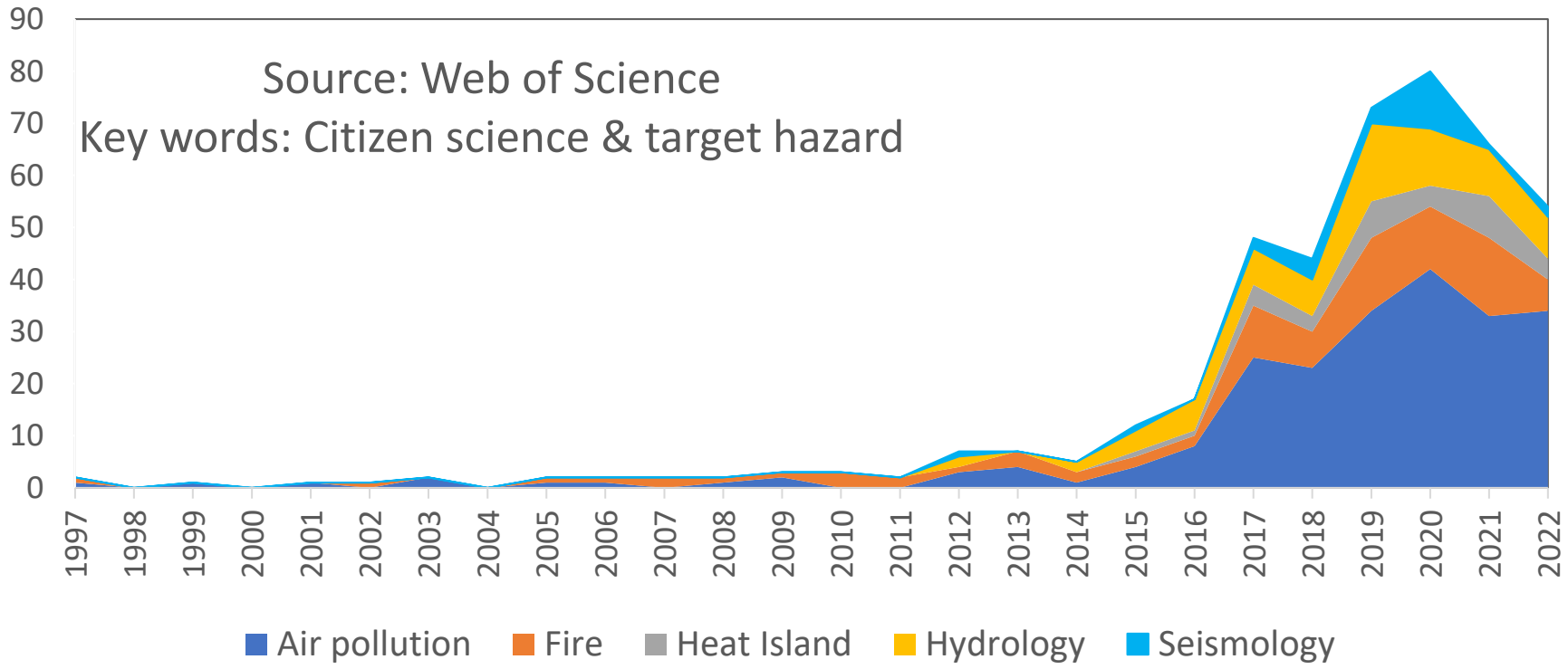
Les capteurs low-cost de plus en plus «citoyens»



Explosion du nombre de publications exploitant les données des capteurs low-cost «citoyen»

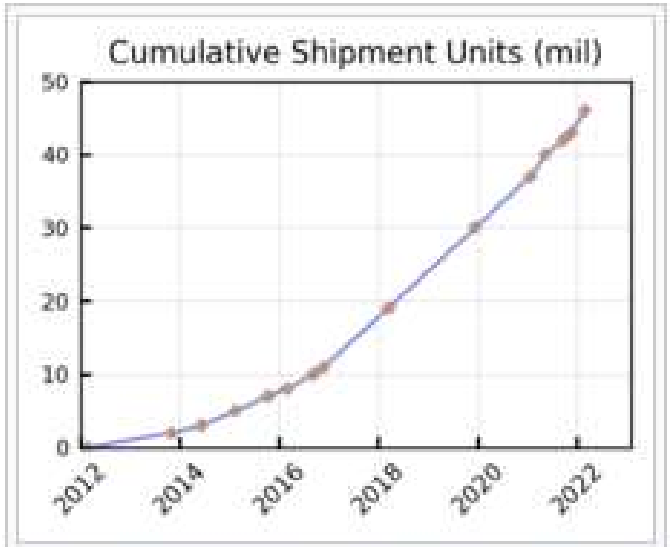


Des capteurs sismologiques low-cost : Exemple des capteurs à base de Raspberry Pi

Le **Raspberry Pi** est un nano-ordinateur monocarte à processeur ARM de la taille d'une carte de crédit conçu par des professeurs du département informatique de l'université de Cambridge dans le cadre de la fondation Raspberry Pi[3].

Source: wikipedia

- coût réduit du Raspberry Pi
- logiciels libres



Cumul des ventes de Raspberry Pi (en millions d'unités).

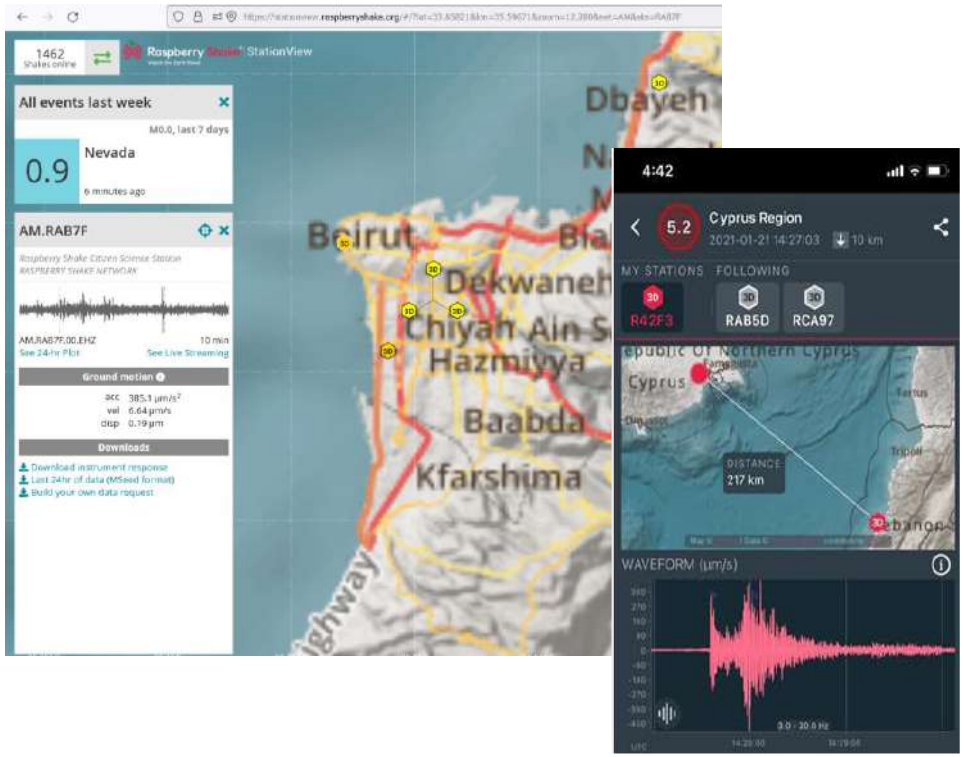
Des capteurs sismologiques low-cost : Exemple des capteurs à base de Raspberry Pi

Raspberry Shake®
Watch the Earth Move

Début en 2016

900 – 1400 €

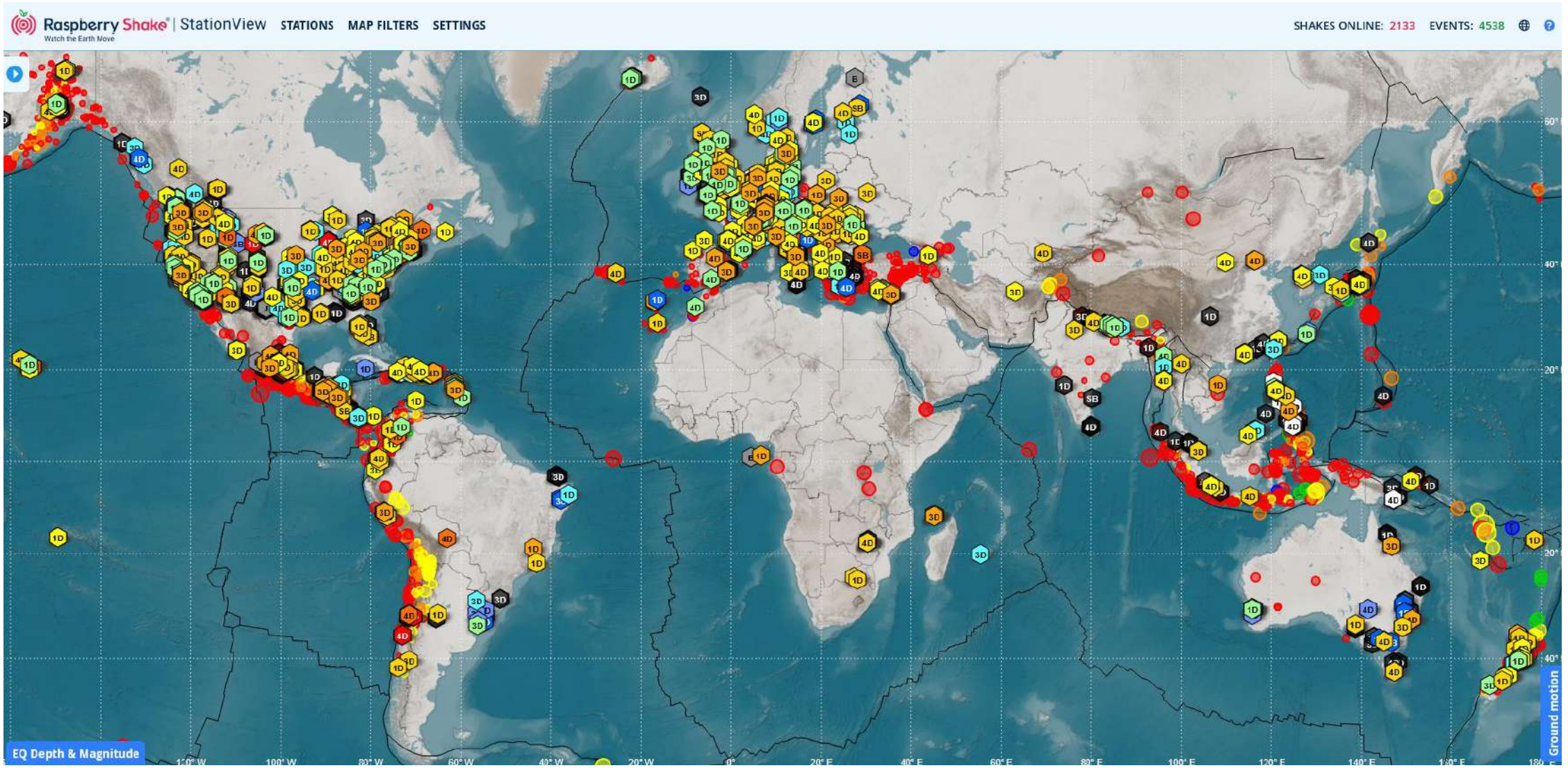
Connection des sismomètres au raspberry PI



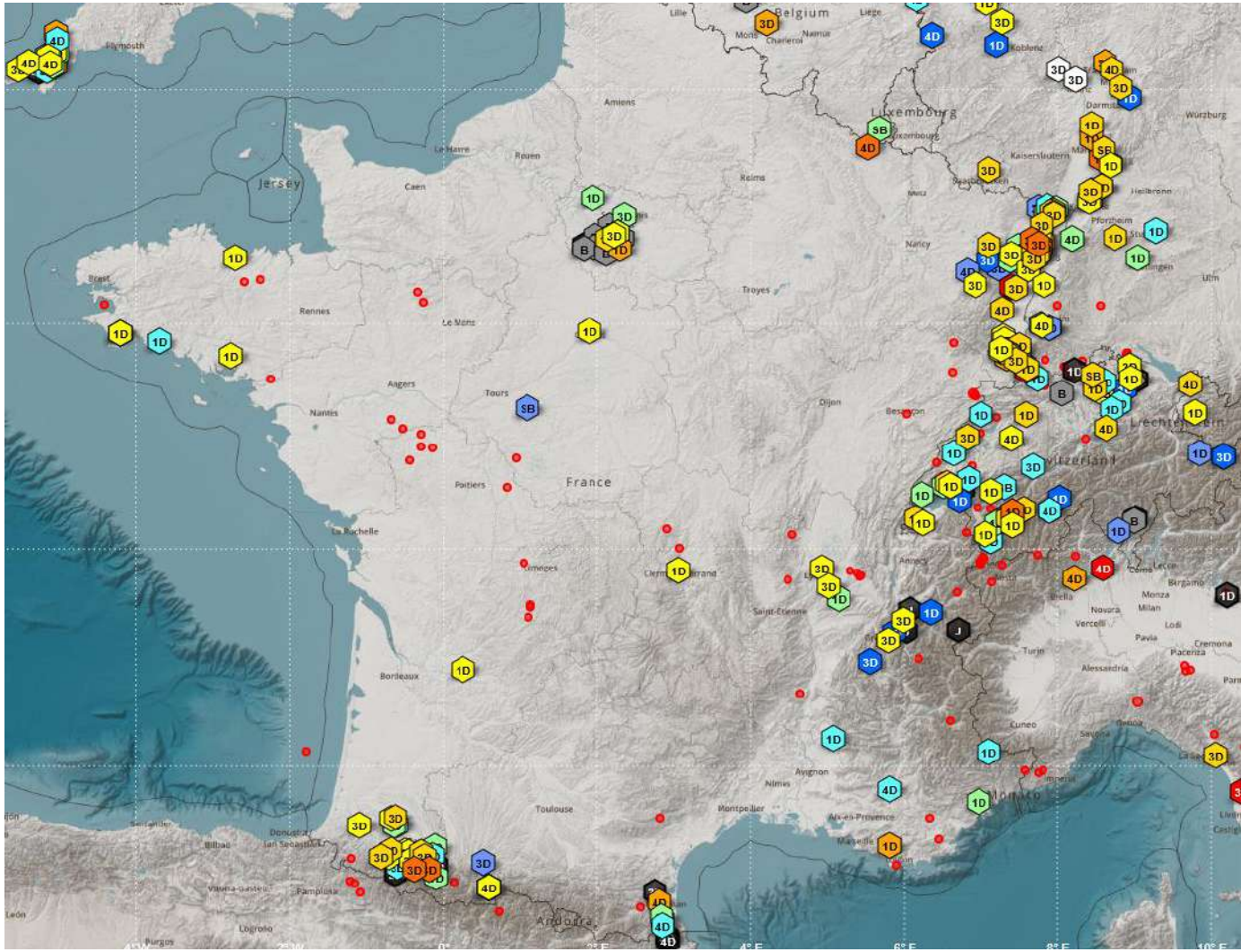
Développement de la chaîne logicielle depuis les données acquises par le Raspberryshake jusqu'aux données brutes accessibles par les portails web et application téléphonique.

Source: https://raspberryshake.org

Standards sismologiques internationaux (IRIS, FDSN)



https://stationview.raspberryshake.org

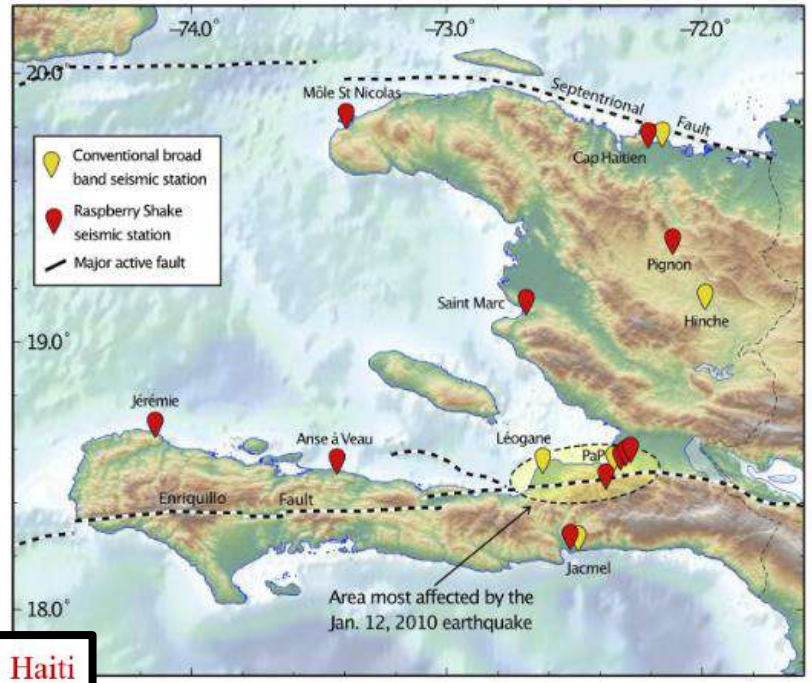


https://stationview.raspberryshake.org

Exemples d'application: suivi de la sismicité

A Socio-Seismology Experiment in Haiti

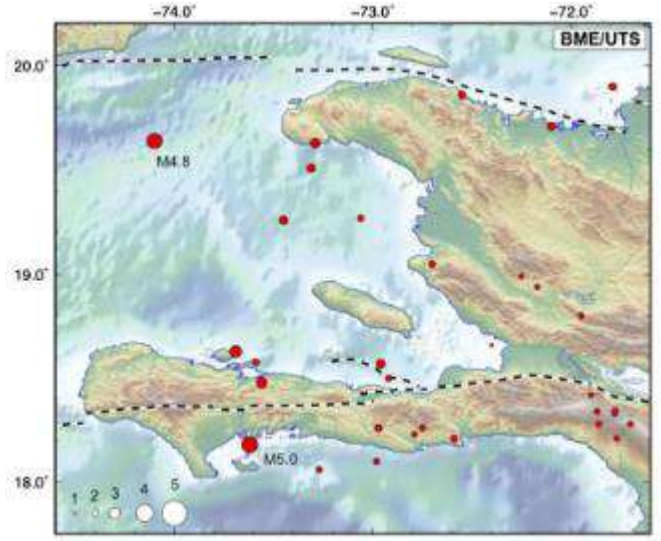
Eric Calais[1,2], Dominique Boisson[3], Steeve Symithe[3], Claude Prépetit[4], Bétonus Pierre[4], Sophia Ulyse[4], Laennec Hurbon[5], Alain Gilles[5], Jean-Marie Théodat[6], Tony Monfret[2], Anne Deschamps[2], Françoise Courboulex[2], Jérôme Chèze[2], Fabrice Peix[2], Etienne Bertrand[2], Jean-Paul Ampuero[2], Bernard Mercier de Lépinay[2], Julien Balestra[2], Jean-Luc Berenguer[2], Remy Bossu[7,8], Laure Fallou[7] and Valérie Clouard[9]*



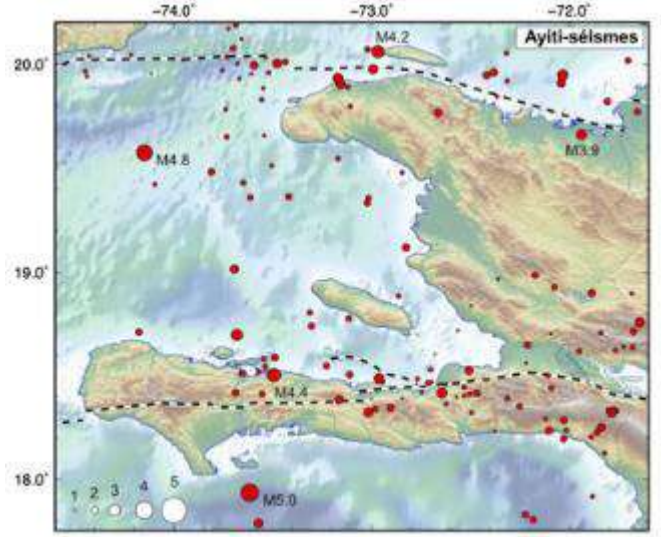
Sismologie Citoyenne en Haiti

Sismo@Ayiti

Carte de sismicité SANS les capteurs low-cost



Carte de sismicité AVEC les capteurs low-cost

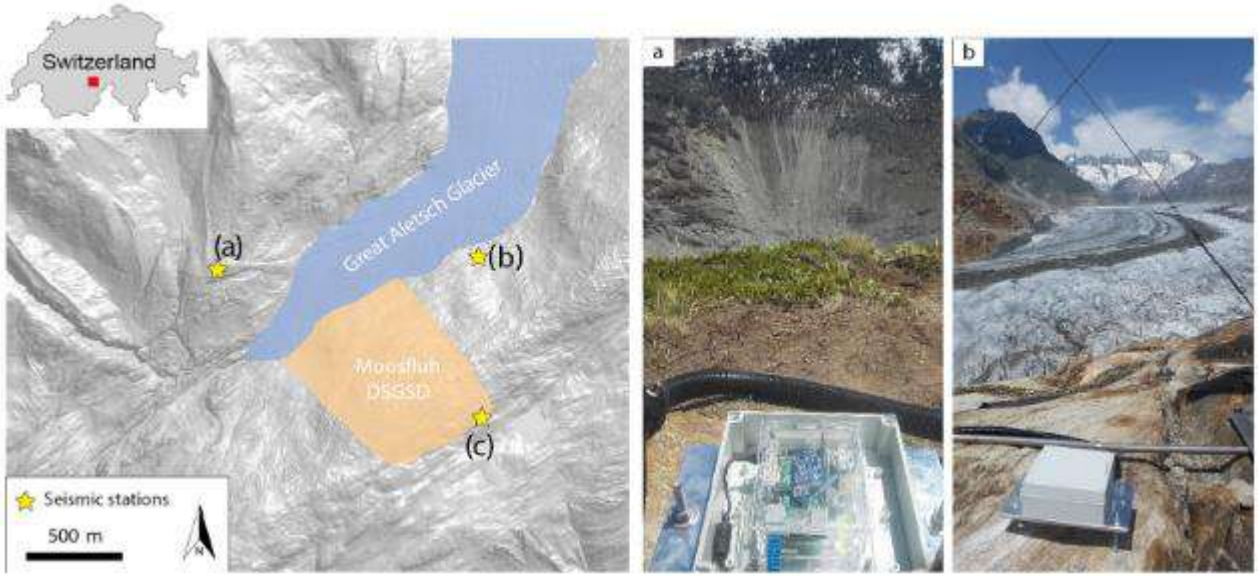


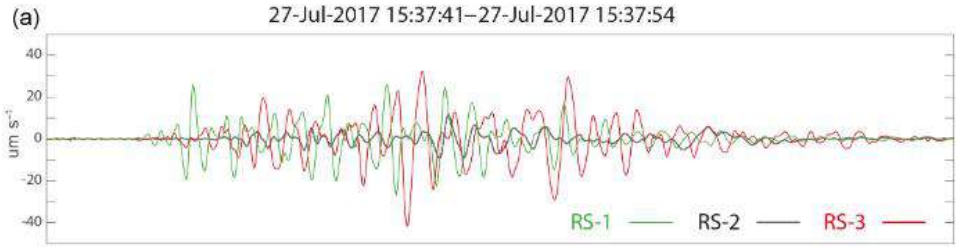
Exemples d'application : suivi des chutes de blocs

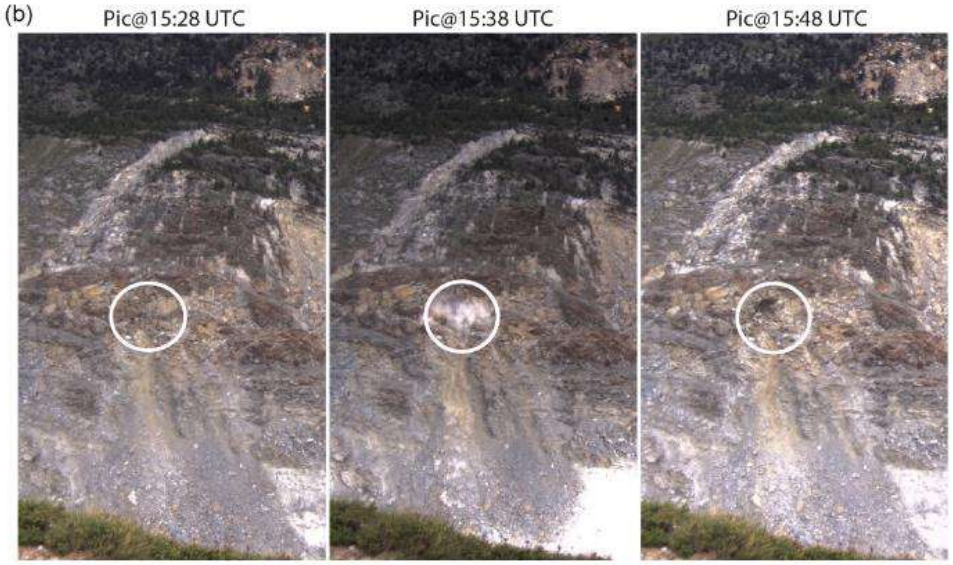
Short Communication: Monitoring rockfalls with the Raspberry Shake

Andrea Manconi[1], Velio Coviello[2], Maud Galletti[1], and Reto Seifert[1]

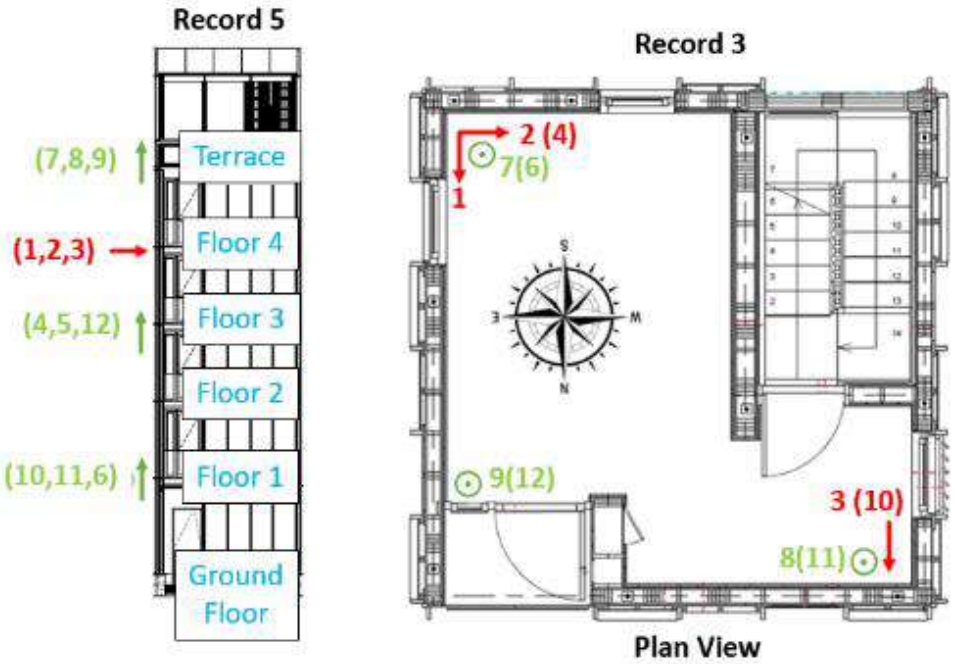
Earth Surf. Dynam., 6, 1219–1227, 2018



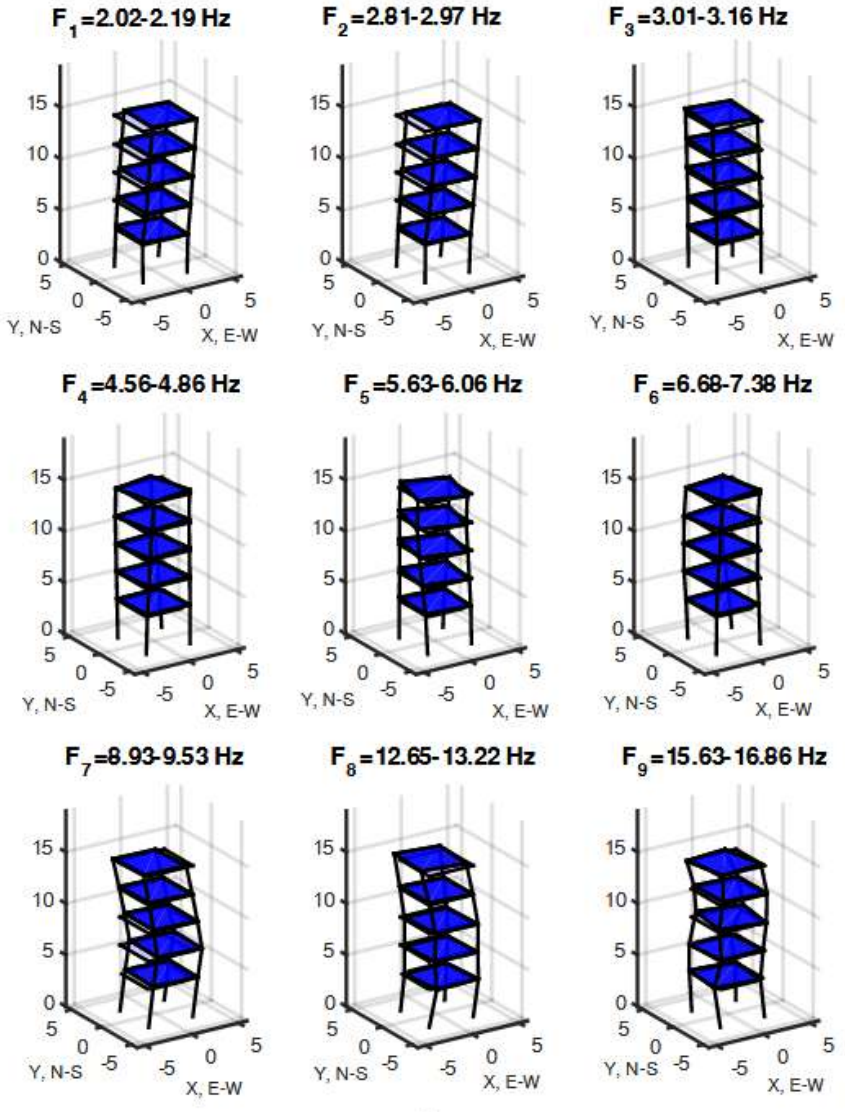




Exemples d'application : comportement des structures

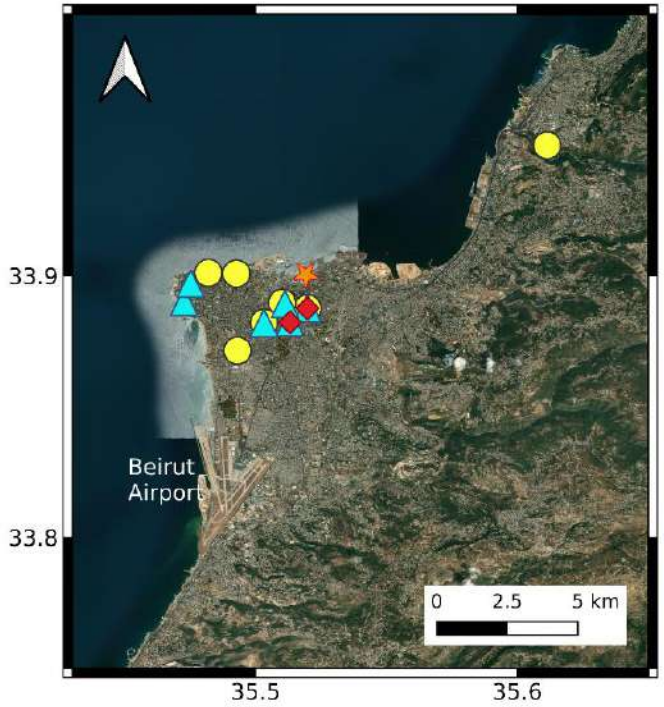


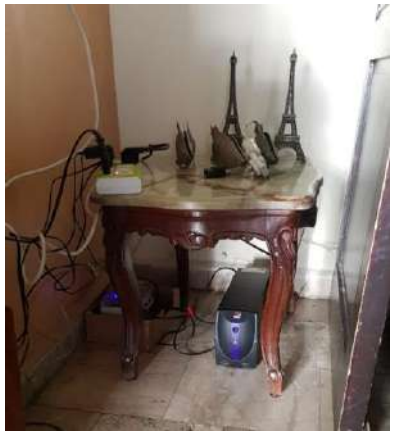
Diaz, M. (2022)



Suivi de la réponse des bâtiments beyrouthins aux forçages environnementaux

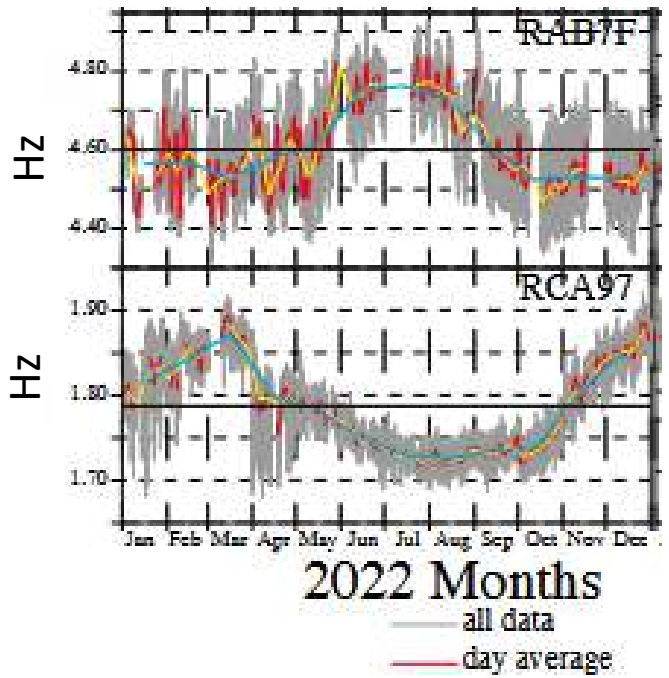
Seismic and Air Monitoring Observatory for Greater Beirut (SMOAG)



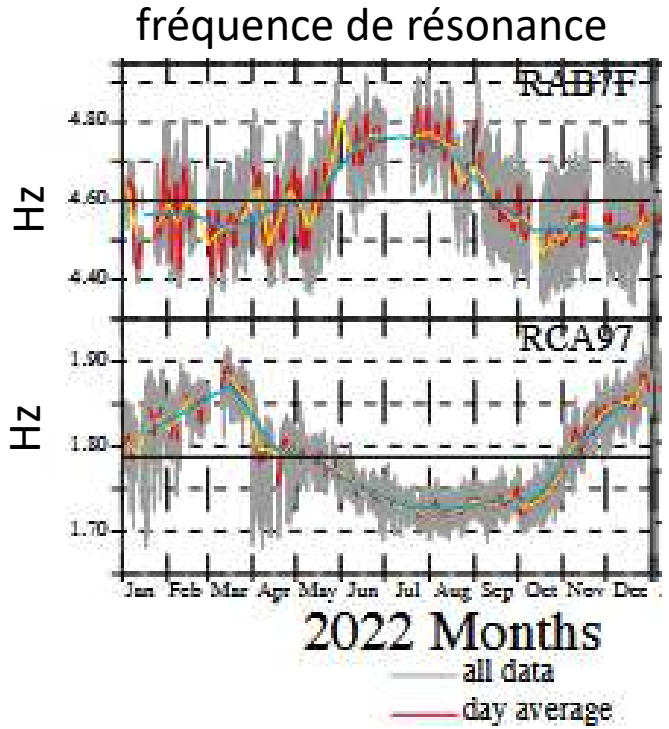


Suivi de la réponse des bâtiments beyrouthins aux forçages environnementaux (température, humidité, vent, …)

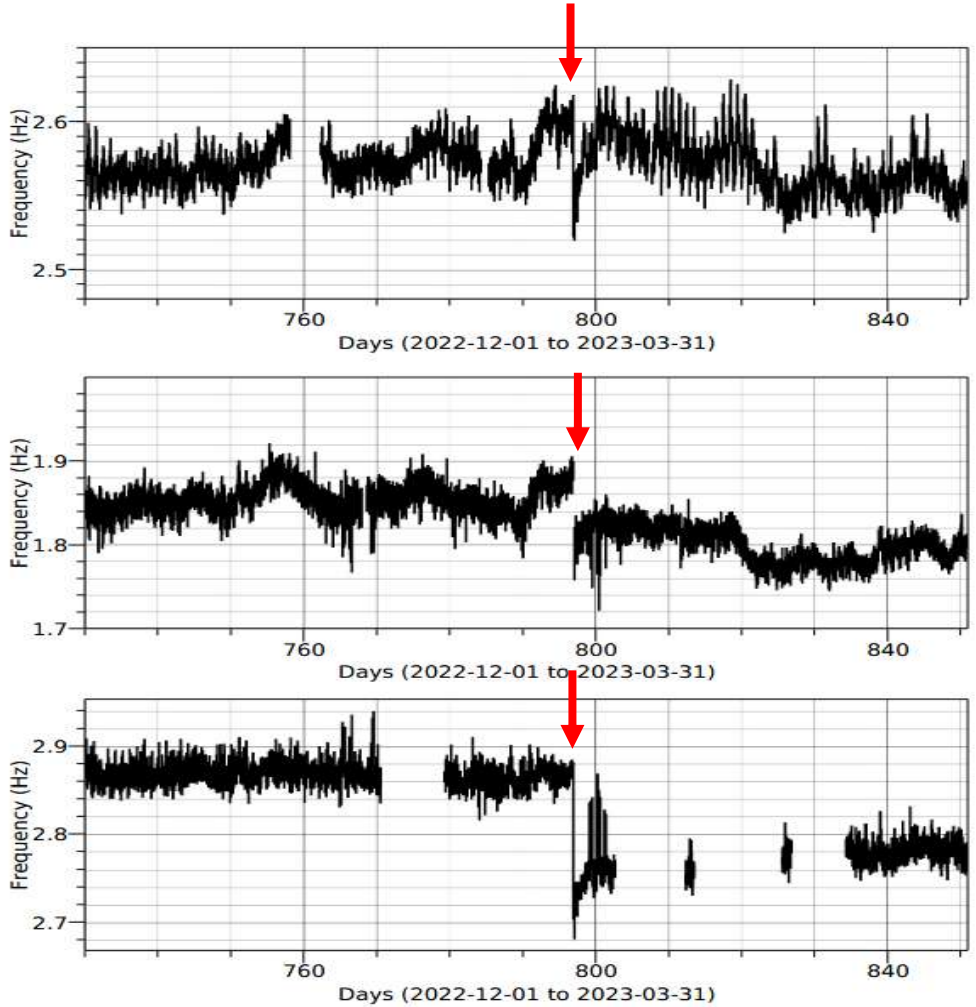
fréquence de résonance



Suivi de la réponse des bâtiments beyrouthins aux forçages environnementaux (température, humidité, vent, …)

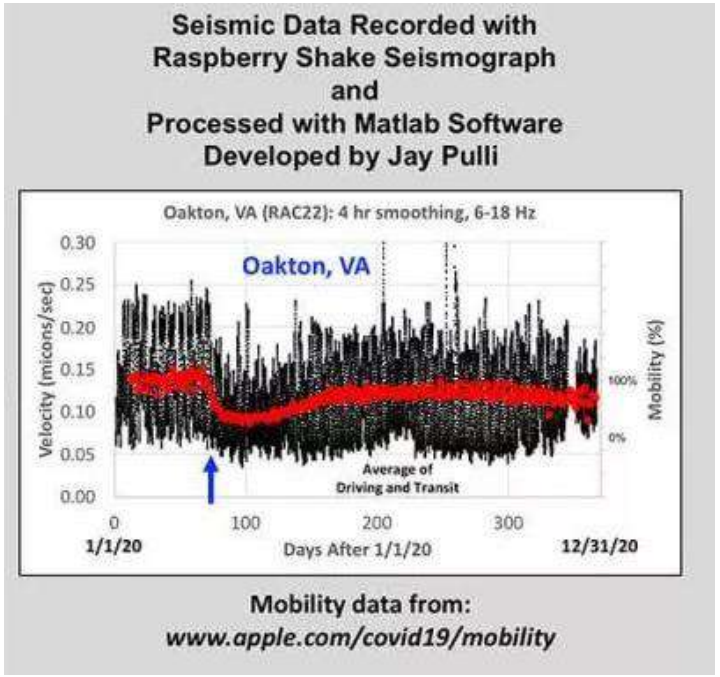


Réponse des bâtiments beyrouthins au séisme de Mw7.8 de Turquie du 6 février 2023



Autres exemples d'application

COVID-19 LOCKDOWNS

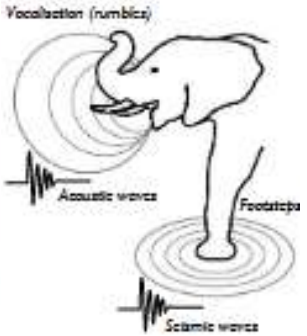


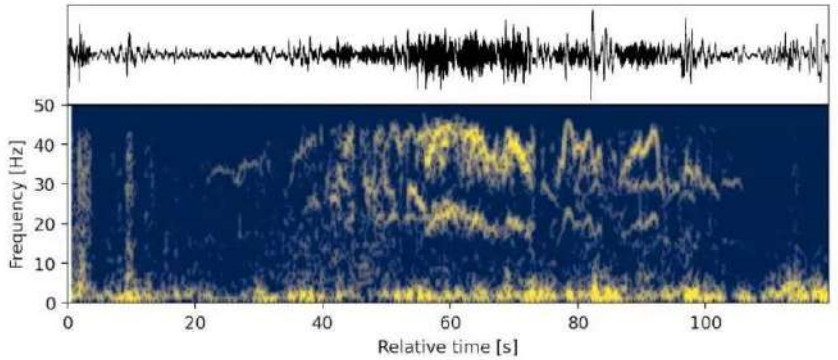
Kafka and Pulli (2020)

Tracking icequakes in Antartica

Winter et al, 2021

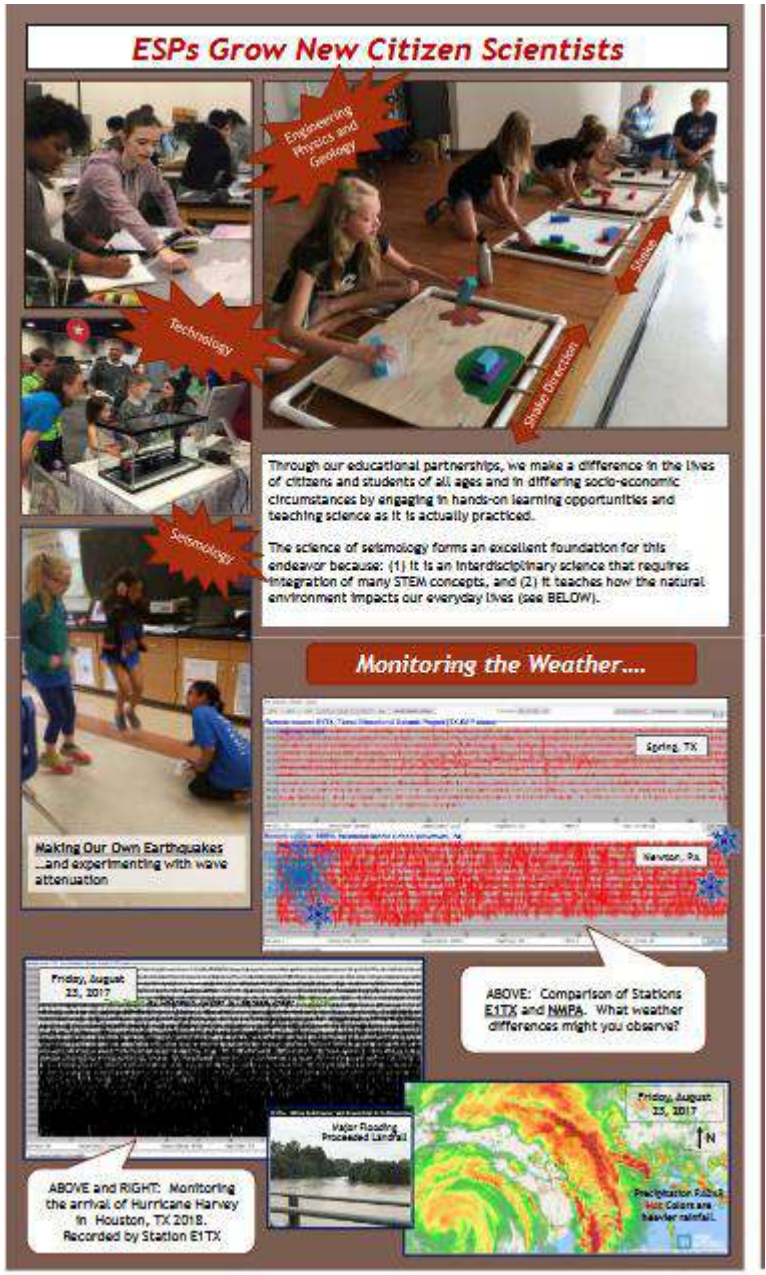
RUMBLES ON THE SAVANNAH: TESTING RASPBERRY SHAKE AND BOOMS FOR DETECTING AFRICAN ELEPHANTS





Lamb et al. 2021

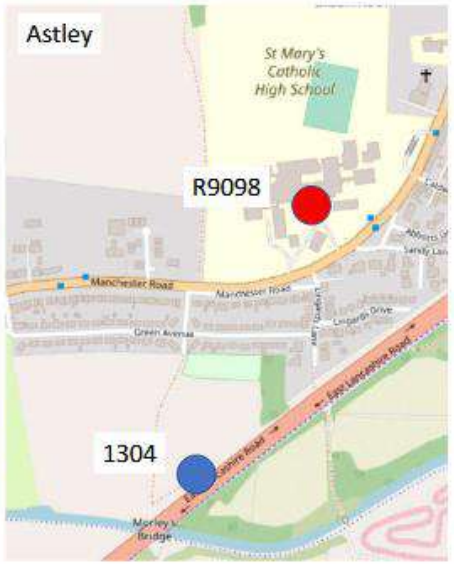
Educational seismology

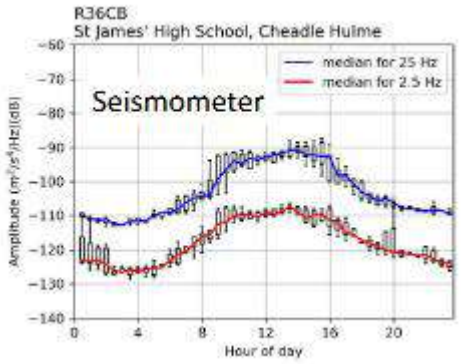


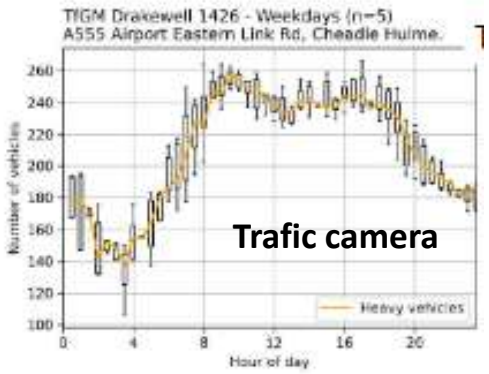
Exemples d'application

Listening to Manchester: using Raspberry Shake seismometers in urban environments to monitor traffic

Dave Healy School of Geosciences, University of Aberdeen, Aberdeen UK d.healy@abdn.ac.uk







Exemples d'application

Listening to Manchester: using Raspberry Shake seismometers in urban environments to monitor traffic

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