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Ground Motion and Unrest Triggering on Volcanoes

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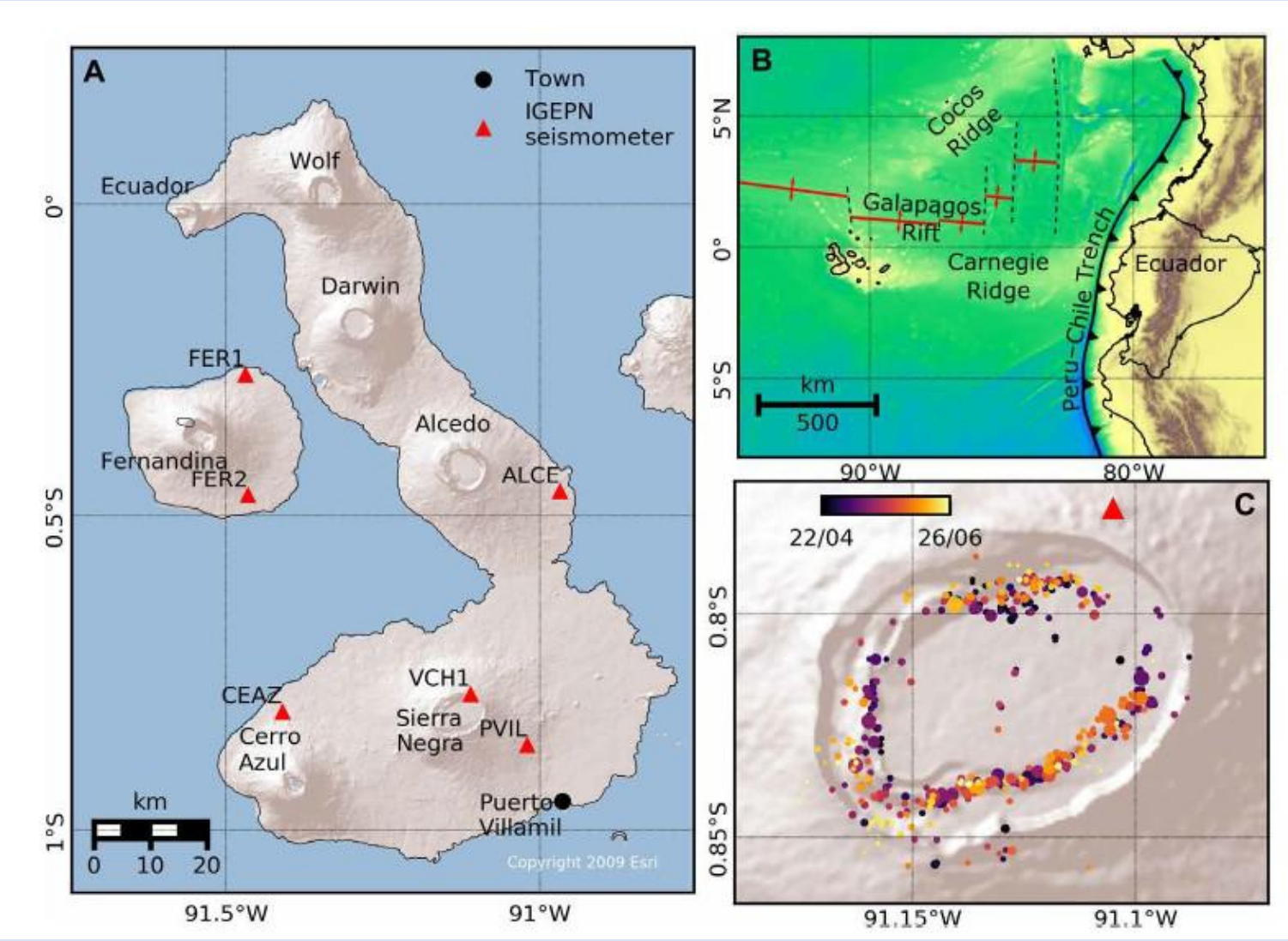
Sierra Negra:

→ Location: Isabela Island, **Galápagos**

→ Type: **Basaltic shield** volcano

→ Has a **trapdoor** fault system

→ Last erupted in **2018**



Bell et al., 2021

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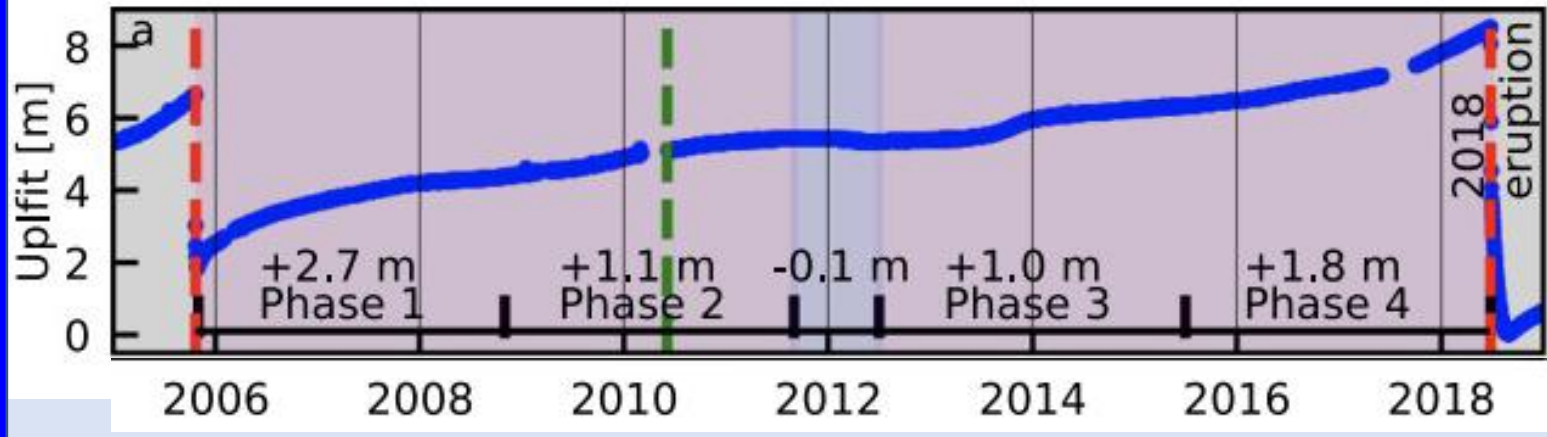

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Event Detection: STA/LTA Algorithm

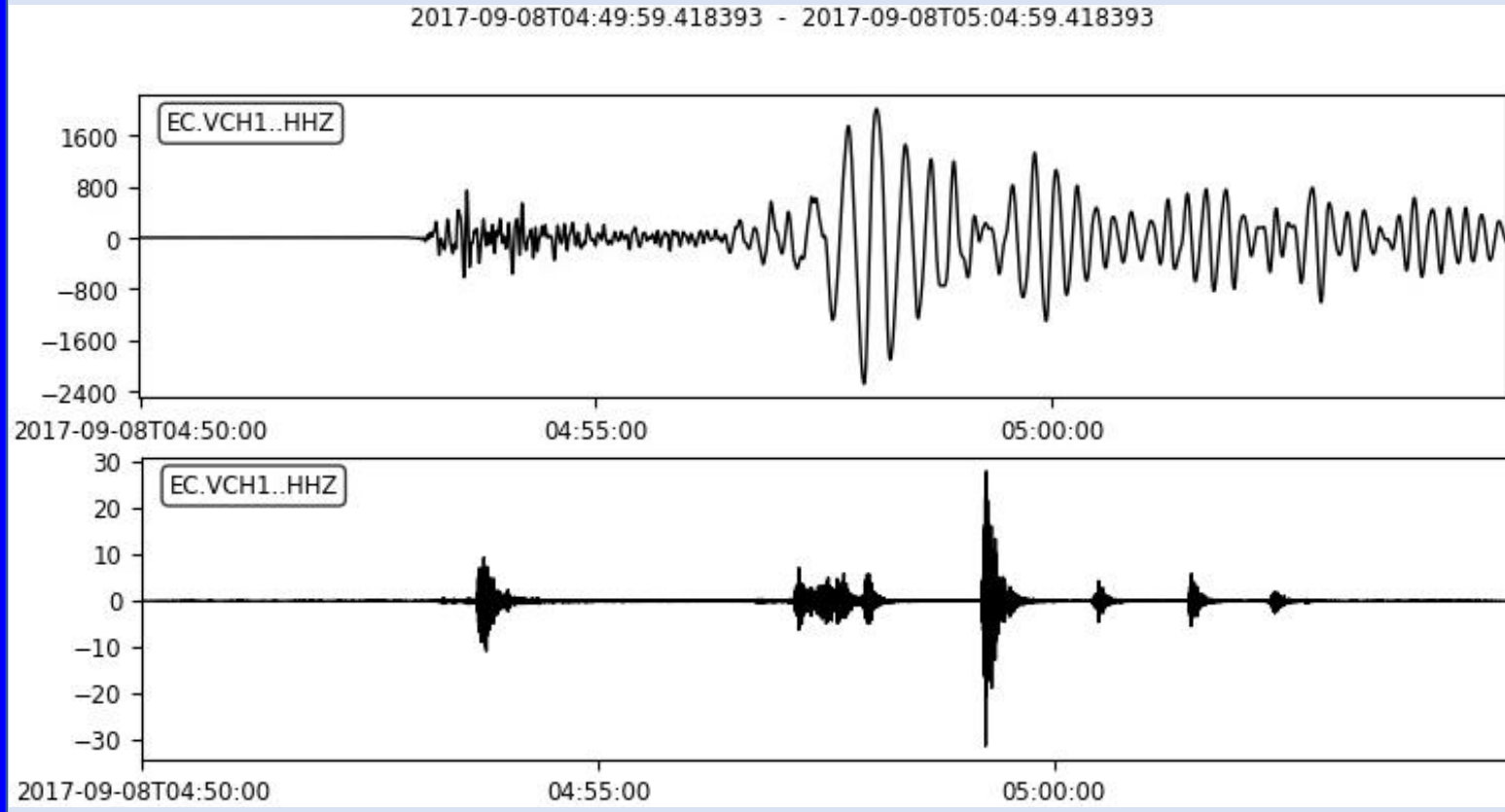
→ To detect dynamically triggered events on Sierra Negra

Case Study 1:

→ Location: Chiapas, Mexico

→ Date: 8th September 2017

→ M_w: 8.2



STA/LTA Algorithm:

Event 1:

→ Location: Ecuador coast

→ Date: 16th April 2017

→ M_w: 7.8

Event 2:

→ Location: Chiapas, Mexico

→ Date: 8th September 2017

→ M_w: 8.1

Event 3:

→ Location: Galápagos Island Region

→ Date: 9th January 2018

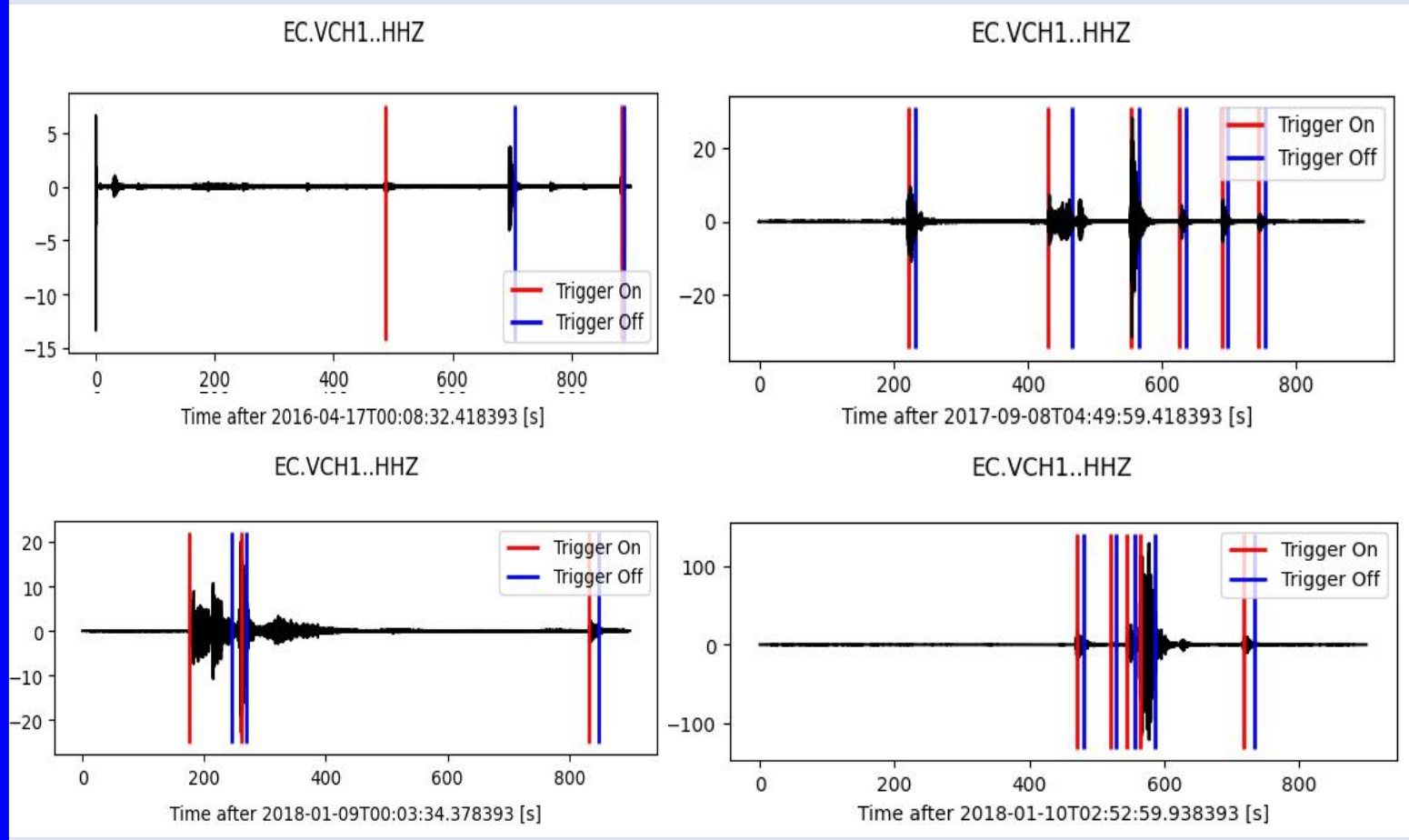
→ M_w: 5.8

Event 4:

→ Location: North of Honduras

→ Date: 10th January 2018

→ M_w: 7.6



Dynamic Strain:

- **Dynamic strain** differs from static strain because it **does not generate a permanent deformation** and **decays more gradually.**

$$DS = \frac{V_{mag}}{C}$$

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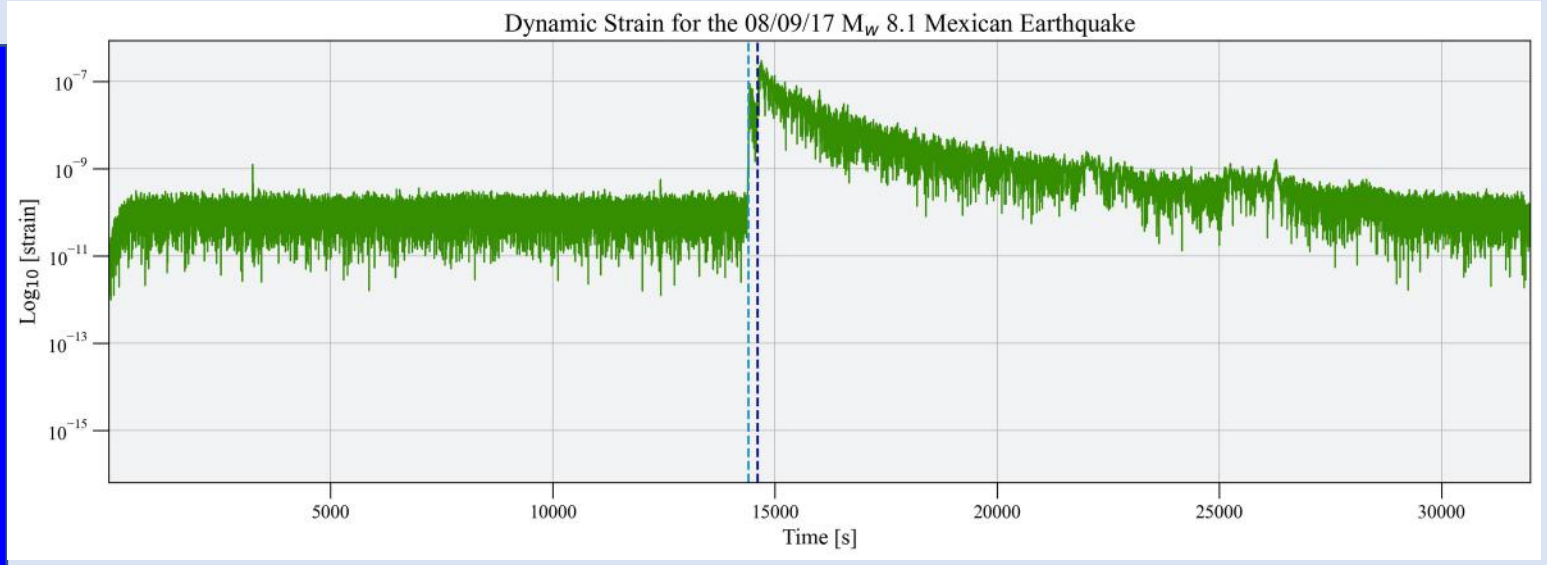
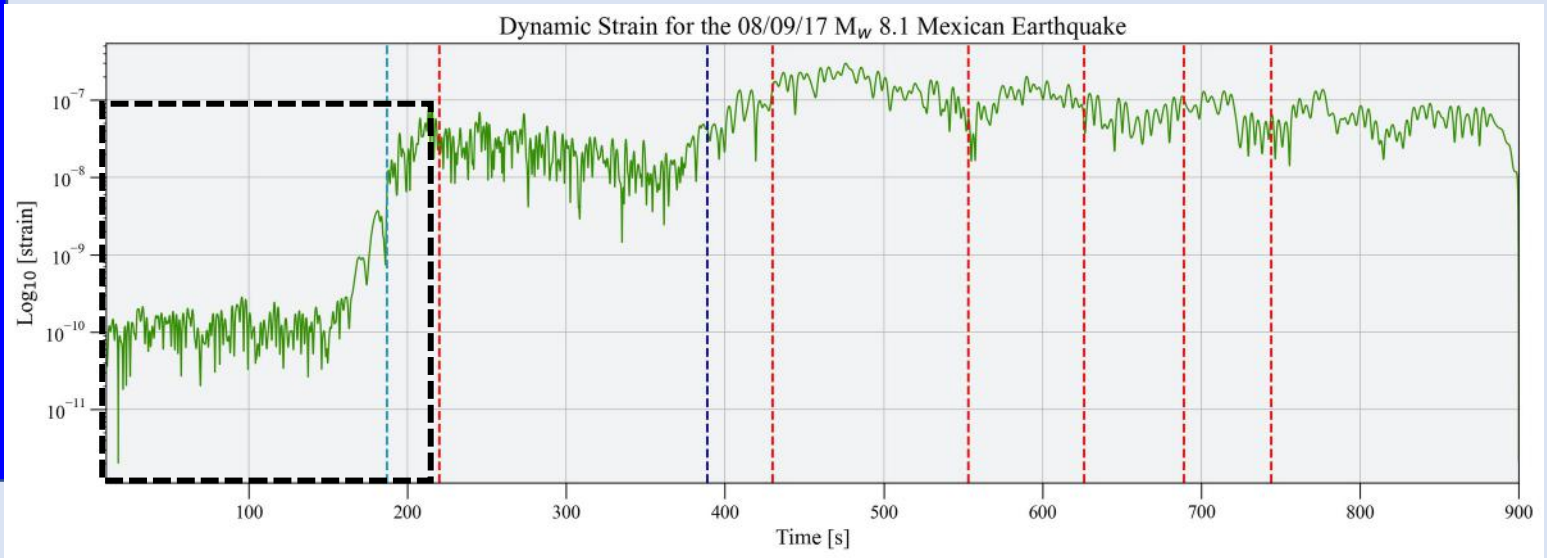
Dynamic Strain questions:

→ What does this mean for the relationship between strain on Sierra Negra?

→ Can Sierra Negra act as a stress gauge when using dynamic triggering?





What's next?

→ Improve statistical confidence of triggered events

→ Event location plotting of triggered events

→ Importance of dynamic strain in relation to the volcanic stress state

→ Move on to other volcanic locations of interest

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