

Best practices and communication protocols of the volcano monitoring and alert Spanish System

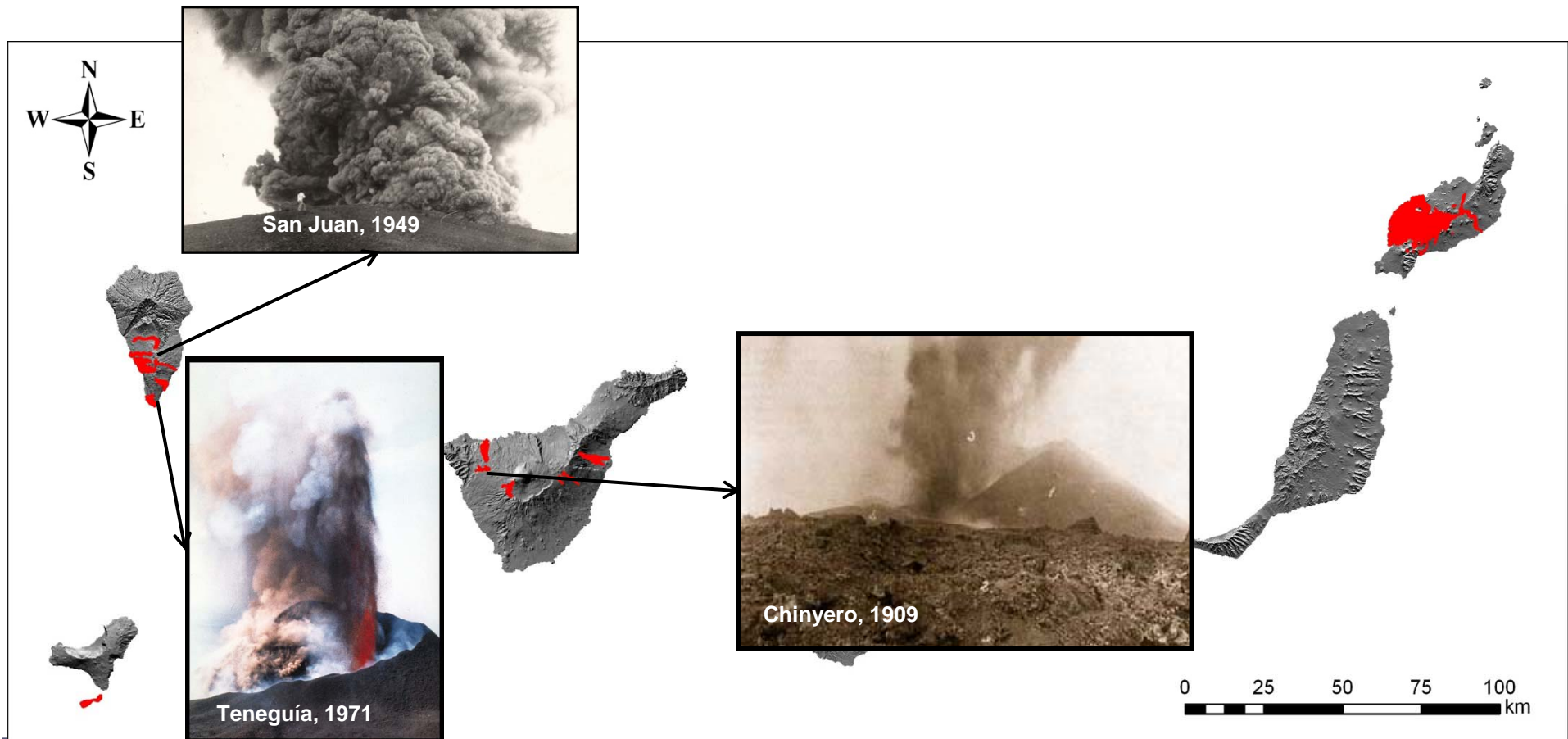
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❖ Historical eruptions in The Canary Islands



We have only **14** well localized historical eruptions in **500** years. When El Hierro eruption started 40 years had passed since previous one.



2010 Regional Civil Defence Plan for Volcanic Emergencies

- **PEVOLCA:** Canarian Civil Defence Plan for Volcanic Emergencies.
Gabinete de Información (Information Bureau)
 - Depends directly on the Director of the Plan
 - The person in charge is the spokesman of Canarian Government, or the person he delegates
 - Only the Information Bureau is authorized to transmit data related to emergency management to both the population and media.
- **IGN:** National Geographic Institute, in charge of volcano monitoring and alert (2004). Also in charge of seismic monitoring (1906)
- **CSIC:** National Council for Scientific Research. Adviser to IGN.
- **IGN-CSIC workgroup.** A group of researches belonging to IGN and CSIC, specialized in volcano monitoring, hazard, forecast and alert.

❖ Baseline before El Hierro eruption.



- **Observatory/scientific limitations. El Hierro case.**
 - Poor definition of foreground activity base levels (seismicity, gases, def....)
 - Lack of instrumental unrest/eruption recording data base
 - Uncompleted knowledge of precursors recognition/interpretation
 - Poor data sharing between institutions and lack of scientific discussion forum
 - Lack of written crisis procedure guide
 - Unclear legal responsibilities frame

- **Decision Makers limitations. El Hierro case.**
 - Poor/non appropriated scientific expertise identification for the different disciplines
 - Emergency Plan never tested/used.
 - Lack of experience in coordinating/head a Scientific Committee for volcanic risk mitig.
 - Lack of awareness of the inherent volcanic risk of the island (politicians, media, population...). No educational local programs.

❖ El Hierro



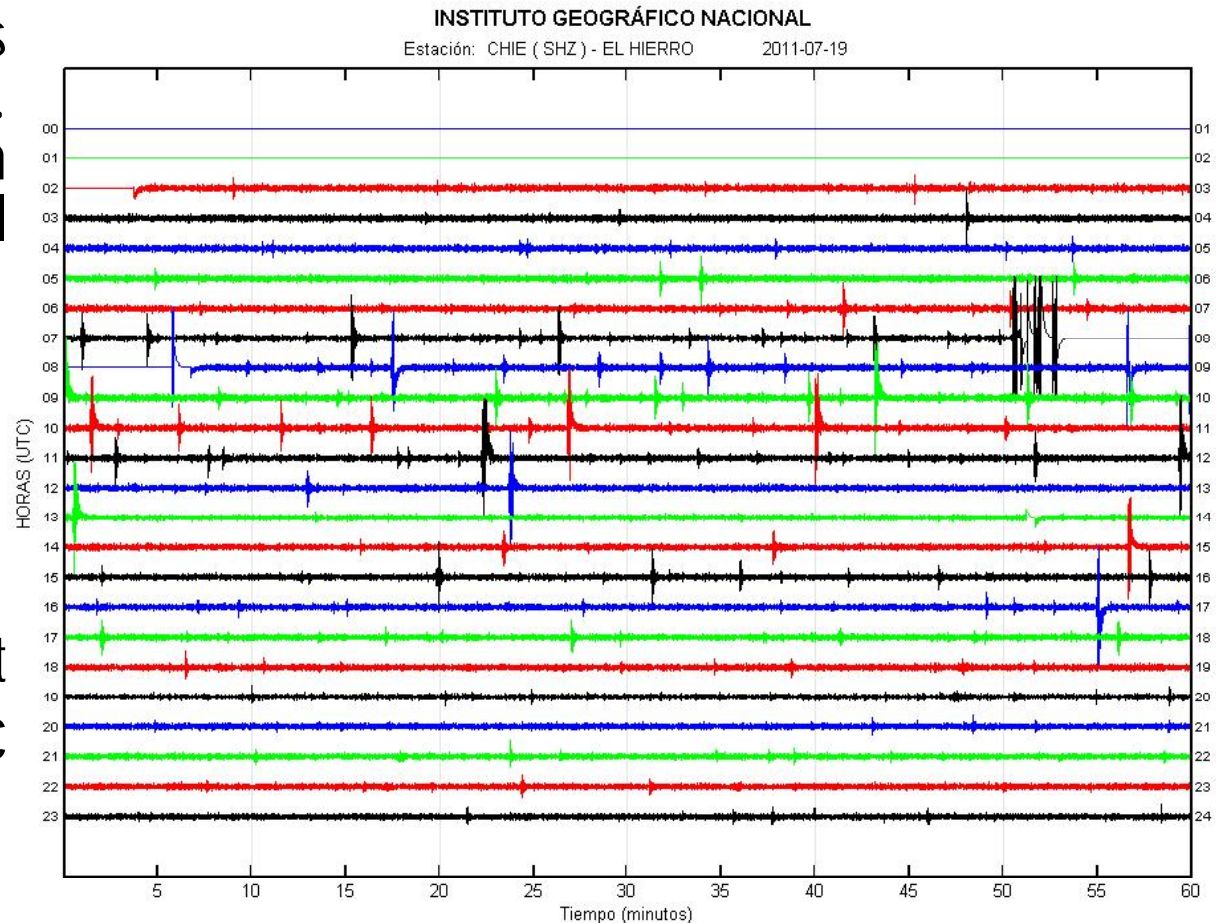
- Small island
- Very steep slopes: 1500 m
- Population ~11000



❖ Unrest: Beginning



- **19/07/2011.** Anomalous activity detected by IGN. Official communication was sent to National Civil Defense
- **20/07/2011.** PEVOLCA is activated.
- **22/07/2011.** First meeting of the Scientific Comitee. **First press note**
- **29/07/2011.** Second meeting of the Scientific Comitee. **Press note**



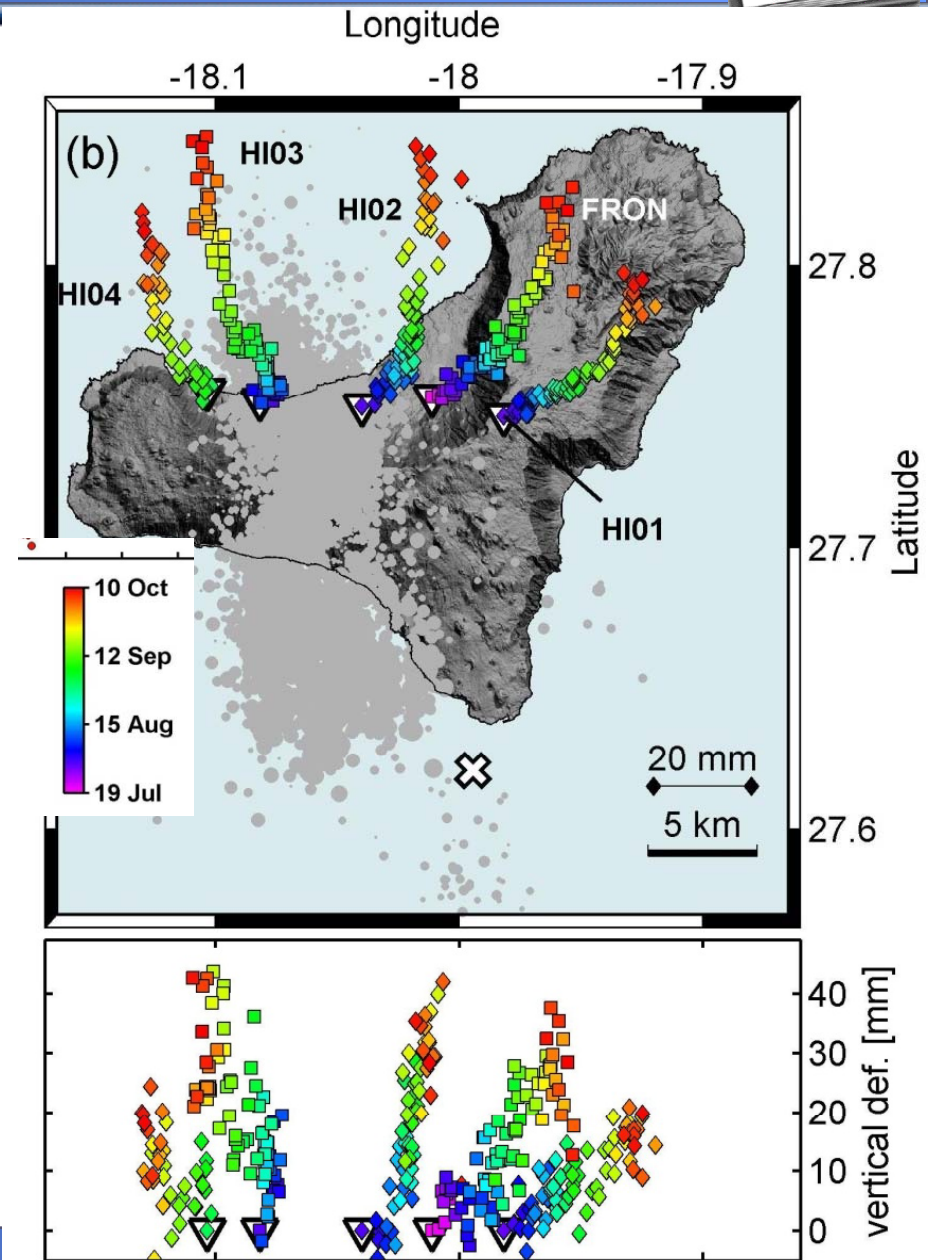
El Comité científico del Pevolca se reunió esta mañana

El Gobierno de Canarias declara la situación de normalidad en El Hierro ante los fenómenos sísmicos

- Se ha designado al Cabildo de El Hierro como portavoz

La Consejería de Economía, Hacienda y Seguridad del Gobierno de Canarias ha convocado por primera vez al Comité de Seguimiento y Vigilancia Volcánica recogido en el Plan Específico de Protección Civil y Atención de Emergencias por Riesgo Volcánico, dado el incremento significativo de actividad sísmica de baja magnitud en la

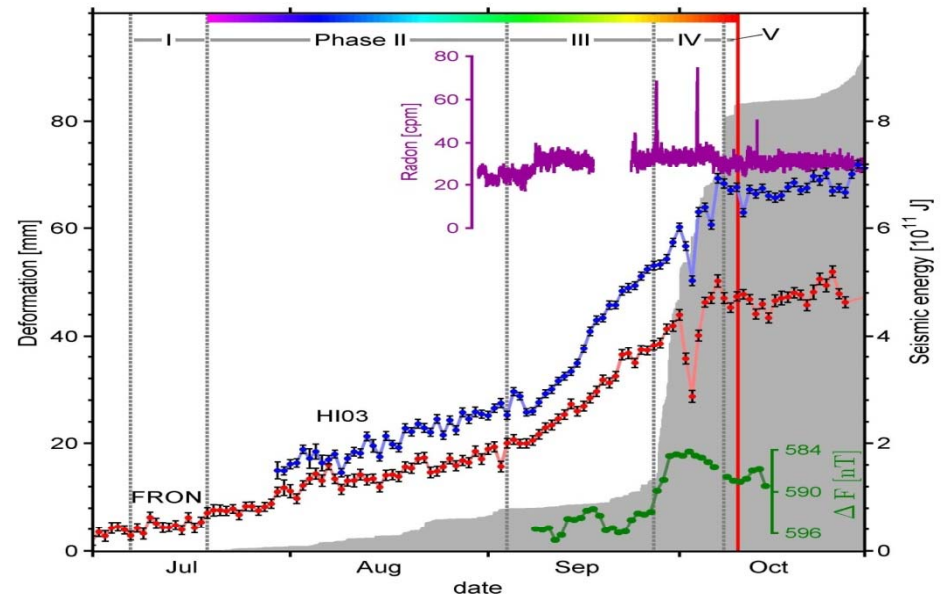
- Anomalous seismic activity continues in cycles. Deformation of 2 cm (8 sep). 2000 loc. ev.
- **Weekly** reports on activity are sent to PEVOLCA by IGN-CSIC
- **02/09/2011**. Meeting of the Scientific Comitee.



❖ Unrest: acceleration



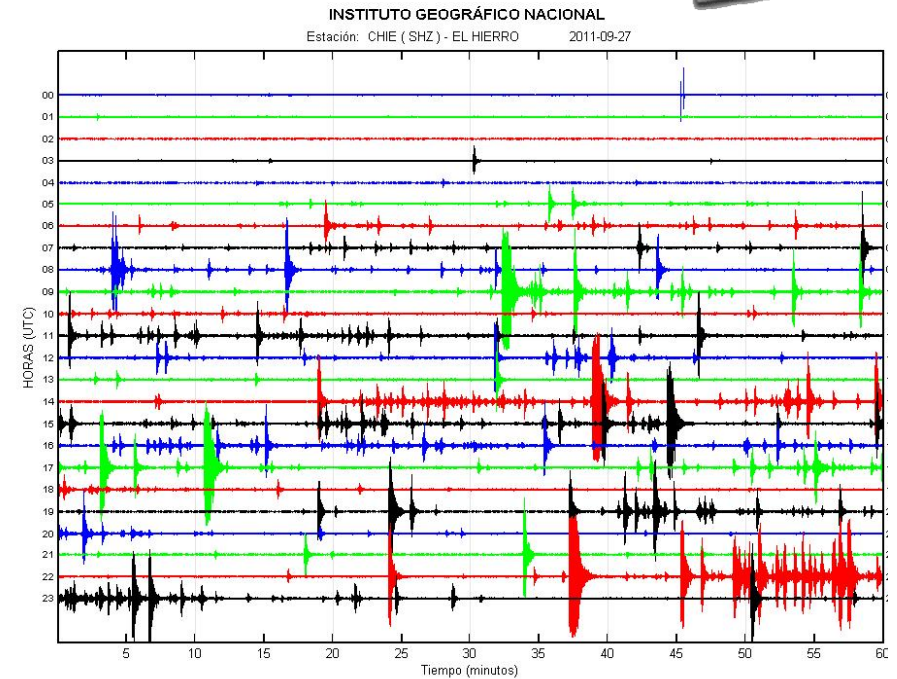
- Acceleration of seismicity. Many felt earthquakes. Acceleration of deformation
- **22/09/2011.** IGN-CSIC sends a special reports to PEVOLCA, including possible scenarios and forecasts.
- **23/09/2011.** Scientific Comitee meeting. PEVOLCA raises the volcanic alert level to yellow
- **Educative talks** are given to the population on different villages of the Island.



❖ Unrest: acceleration

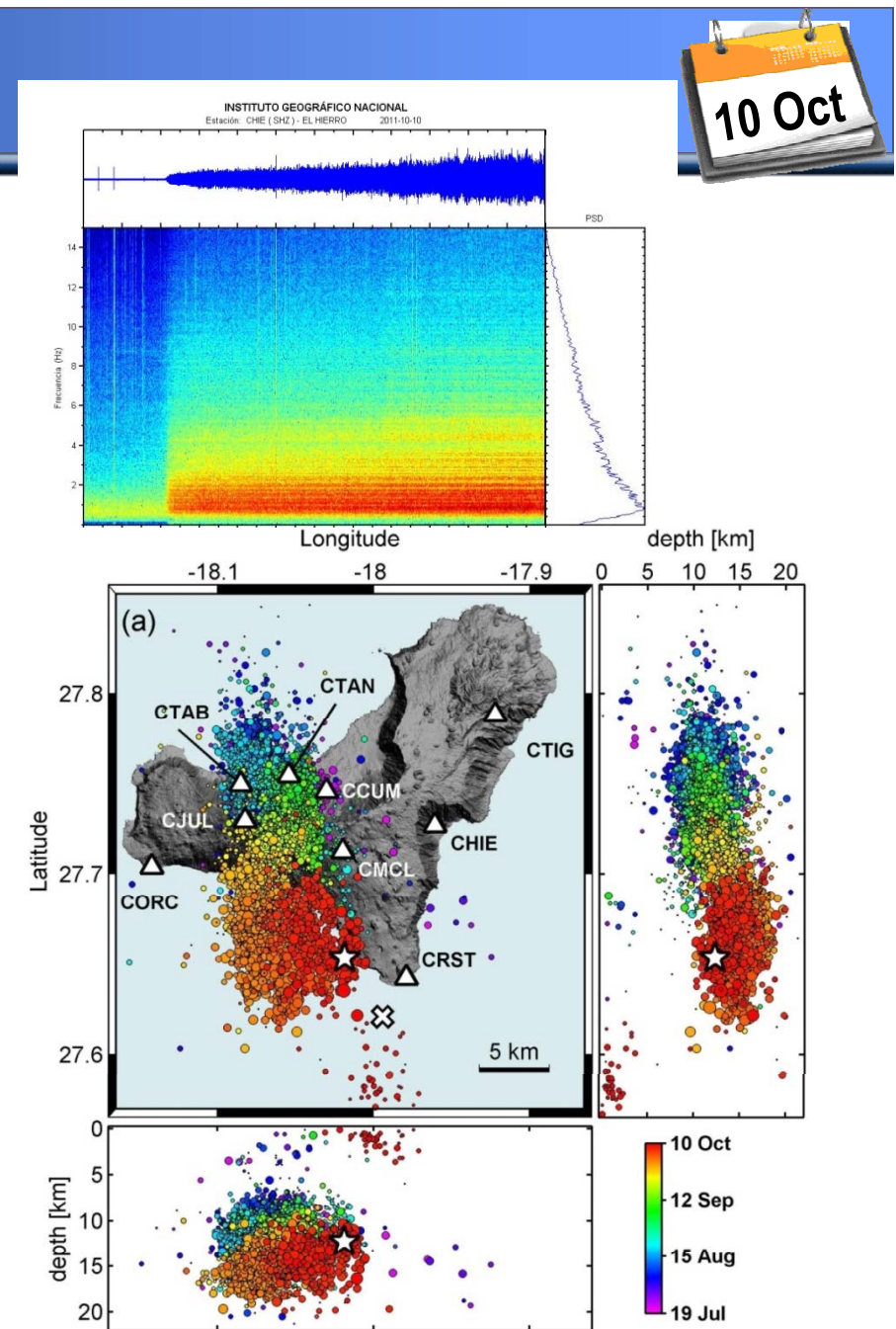


- **27/09/2011**
- **FIRST EVACUATION** due to rock fall risk in N of El Hierro (53 people). Los Roquillos tunnel is closed. Public complain.
- The press reflect the sharp disagreement between politician and managers.
- Media complaints for lack of understanding and clarity of PEVOLCA statements → managers hide the scientists
- Social media and the press began to speculate on catastrophic scenarios
- Due the situation, IGN, starts to act as spokesman.
- IGN sends daily activity summaries to PEVOLCA and gives a press communicate every morning



❖ Eruption: beginning

- **10/10/2011 04:15**
Tremor signal appears. The amplitude increases along the day.
- Helicopter flight (afternoon): dead fishes floating
- Deployment of CAP (Centro de Atención Permanente) at La Restinga. 24h



❖ Eruption: beginning



Photo: Desiree Martin 10oct

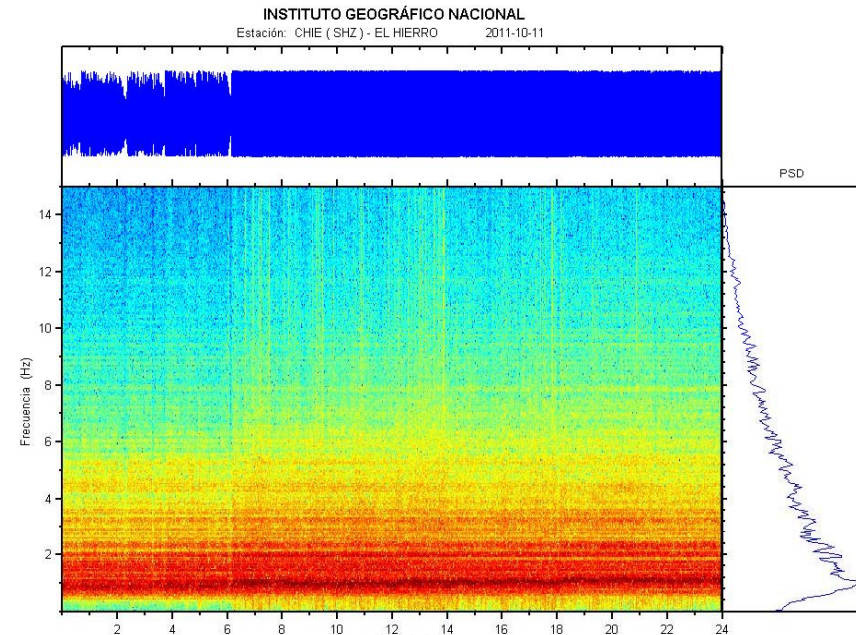
- Meeting of Scientific Committee.
- Press conference

- During these three days communication of IGN-CSIC with PEVOLCA is very frequent, not only through written reports but by phone or mail

❖ Eruption: first days



- Amplitude of the tremor increases abruptly. Vibration is felt by population on S El Hierro.
- PEVOLCA raises the volcanic alert level to red in La Restinga
- FIRST EVACUATION of La Restinga village.



❖ Eruption. Significant events

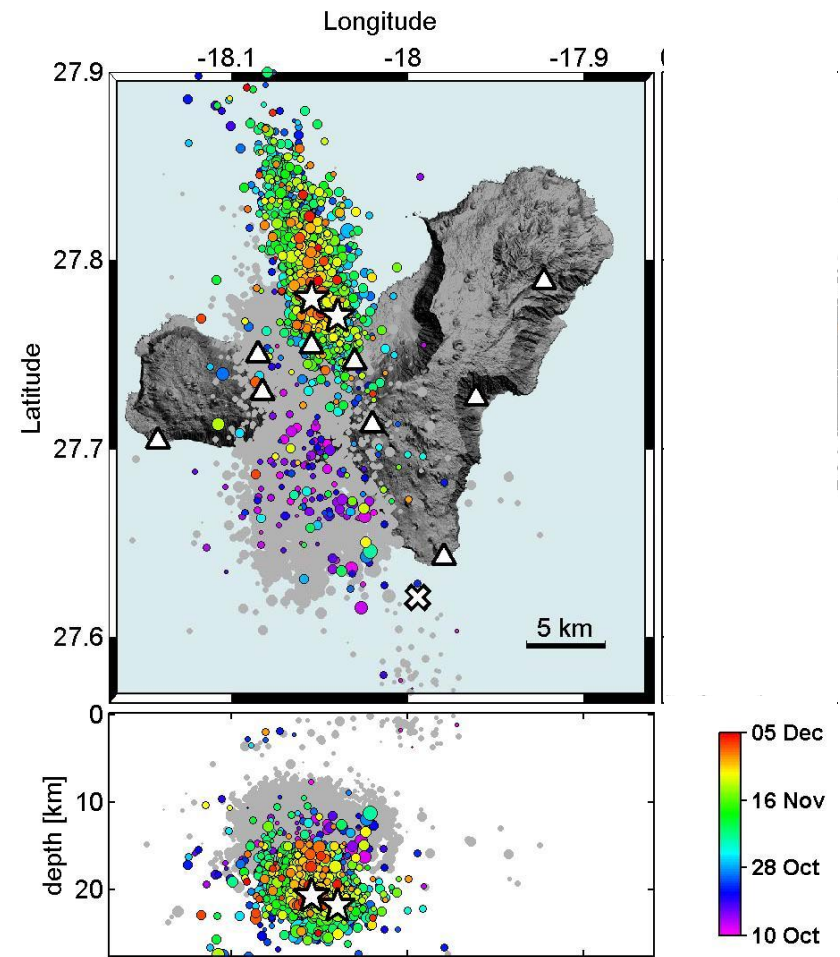


- 21/10/2011 Evacuees from La Restinga return home
- 27/10/2011 Reopening of Los Roquillos tunnel

- Late October – November.
Seismic activity increases off shore N El Hierro (20 km depth). High ground acceleration on felt earthquake.

Sharp disagreement between scientifics. 2nd eruption?

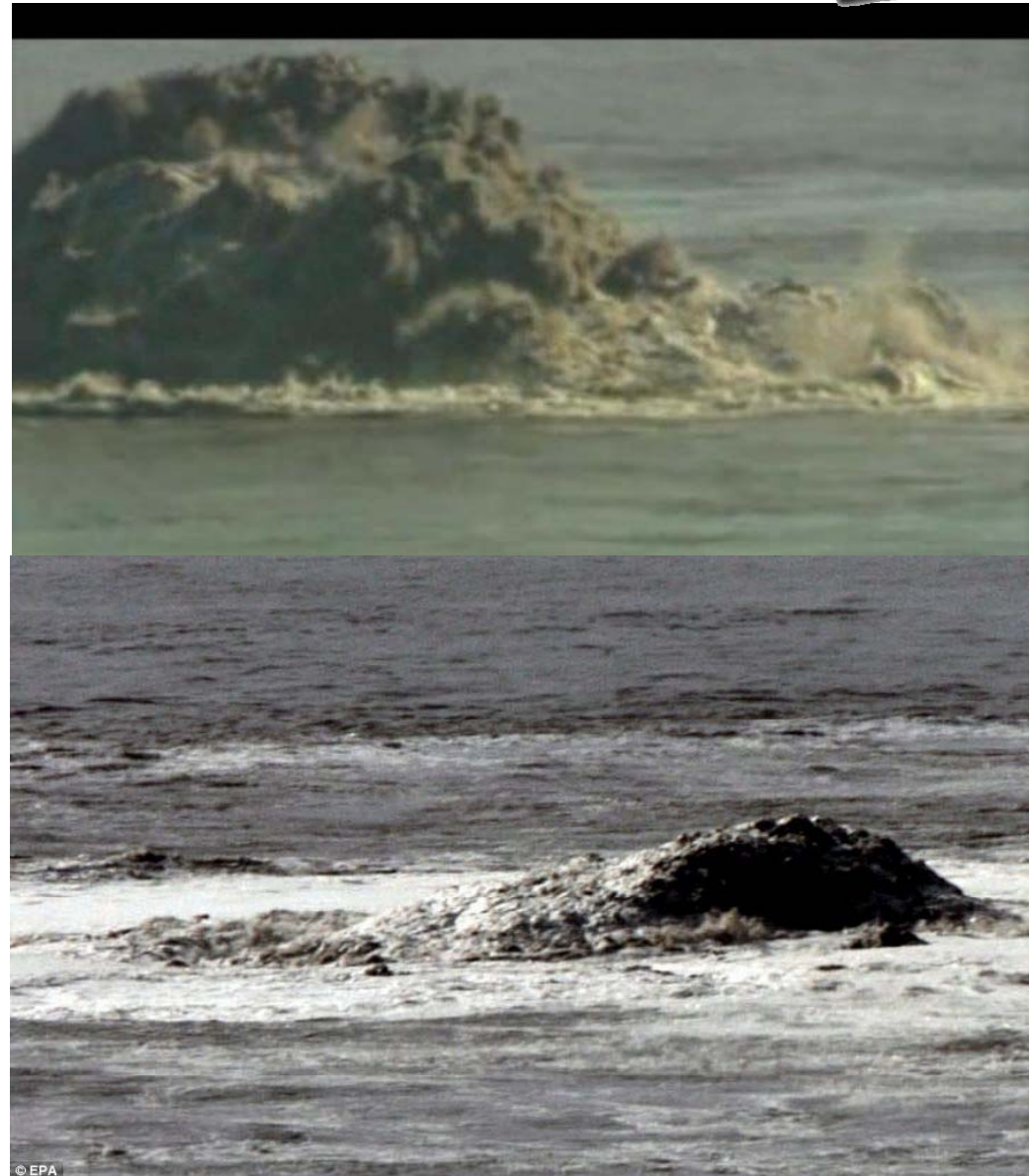
- 04/11/2011. Tunnel closed.
Evacuation of 11 houses in the N due to rock fall risk



❖ Eruption. Significant events

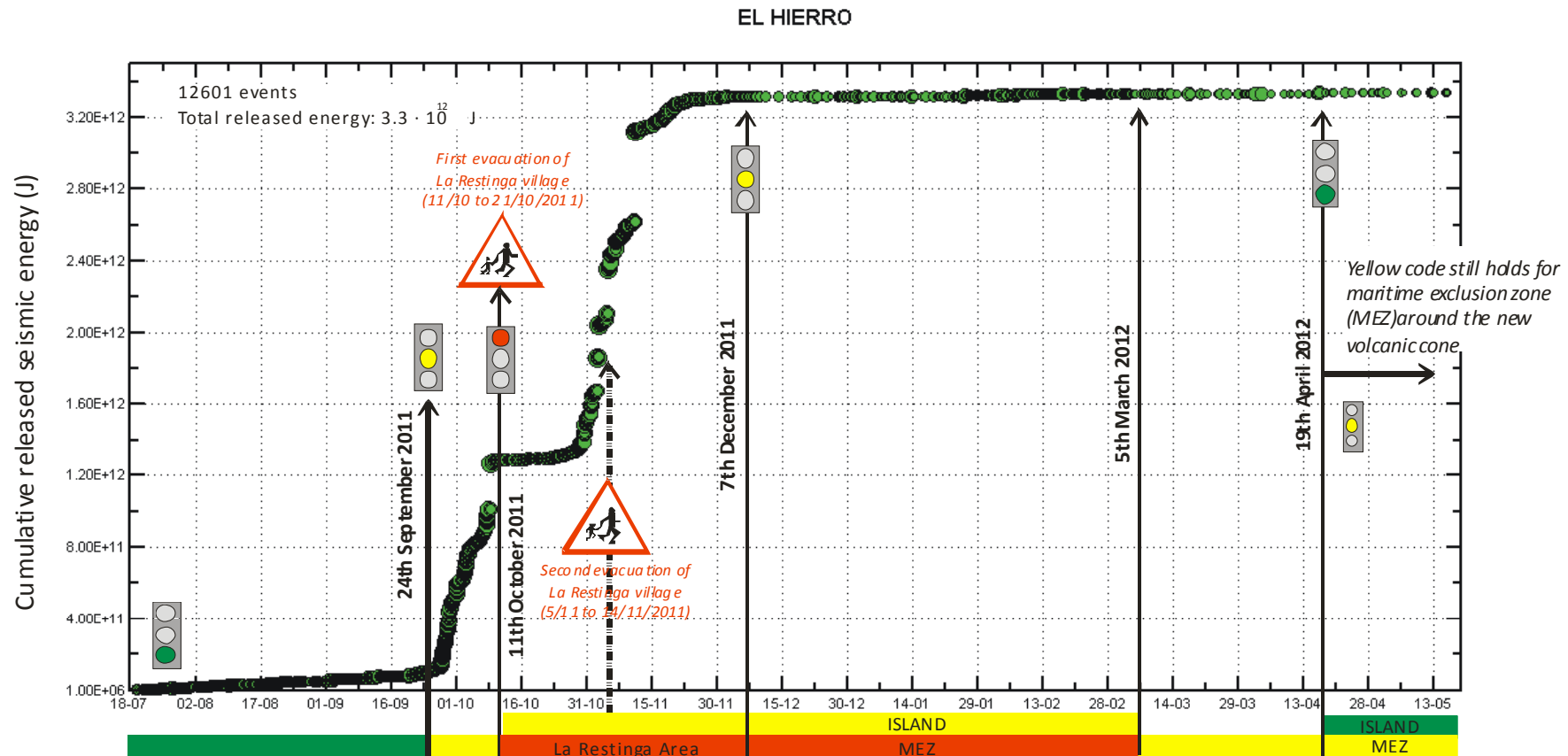


- 05/11/2011 and 07/11/2011 Big bubbles of water and fine material appear over the vent
- 05/11/2011 **EVACUATION** of La Restinga village.
- 14/11/2011. **Back home** of evacuees from La Restinga. Reopening of Los Roquillos tunnel during daytime
- IGN sends daily reports to PEVOLCA and special notes when there are significant changes in the activity
- PEVOLCA publishes press notes in their web page with variable periodicity



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❖ Traffic-light alert code



Traffic light alert code in PEVOLCA is designed for the population as a descriptor of what they should do. But many people interpreted it as a descriptor of the volcano behaviour.

❖ The role of media

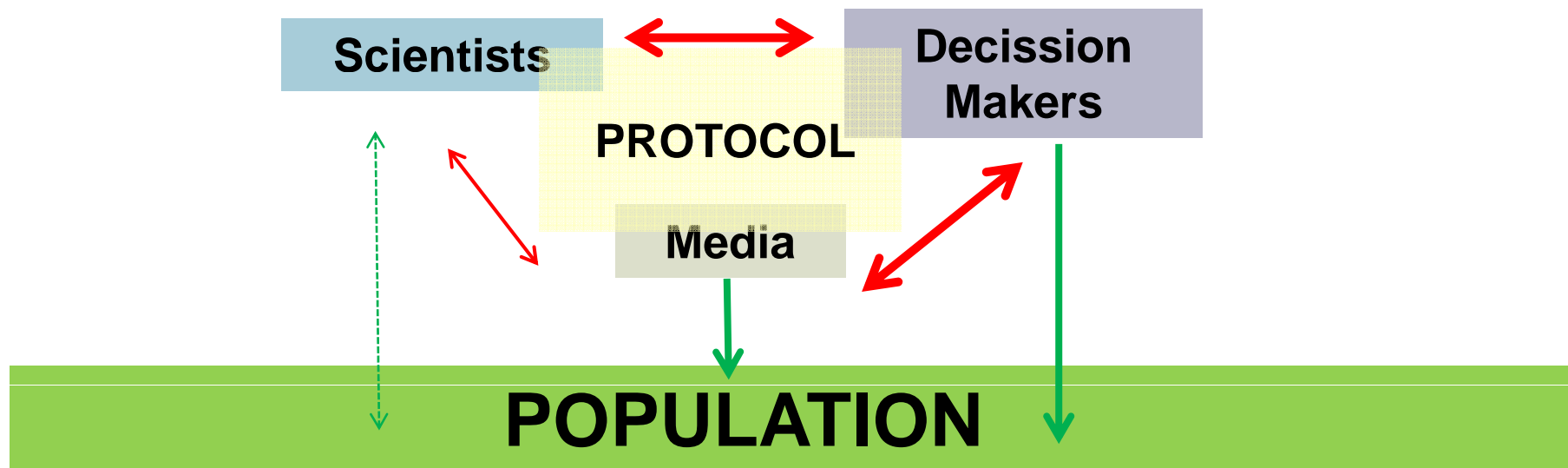


Media pressure was increasing close the beginning of the unrest due that the journalist were sent to the island, remaining there for week waiting the eruptions, looking for headlines and trying to get official and un official information

- Lack of knowledge on volcanology and its jargon
- Feeling that scientist and authorities have interests beyond volcanic risk mitigation
- Discrepancy → mistrust and abandonment feelings
- Some times, greater trust on non-official sources
- Lack of experience makes them more susceptible to rumors

makers

population



❖ Factors that could improve communication. Lessons learned.



■ Before crisis:

- Need and appropriate and detailed Communication protocols
- Specific training of the different actors (scientists, media, decision makers, population...).
Definition of appropriate language
- Definition of a Legal framework and professional conduct best practices
- Comprehensive test of the framework (simulation exercises...)

■ During crisis

- Avoidance public opinion discrepancies
- Mechanism and methodology to ensure the expertise of the scientific committee
- Consensus prior communication
- Single voice for the communication
- Clear communication

■ After crisis

- Evaluation of effectiveness of communication (questionnaires, interviews...)
- Critical analysis of communication procedures
- Upgrade best practices and protocols

*Thank you
for your attention...*