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Apoyeque Volcano: Advances from the PREVIA project into Community Risk perception and sense of preparedness

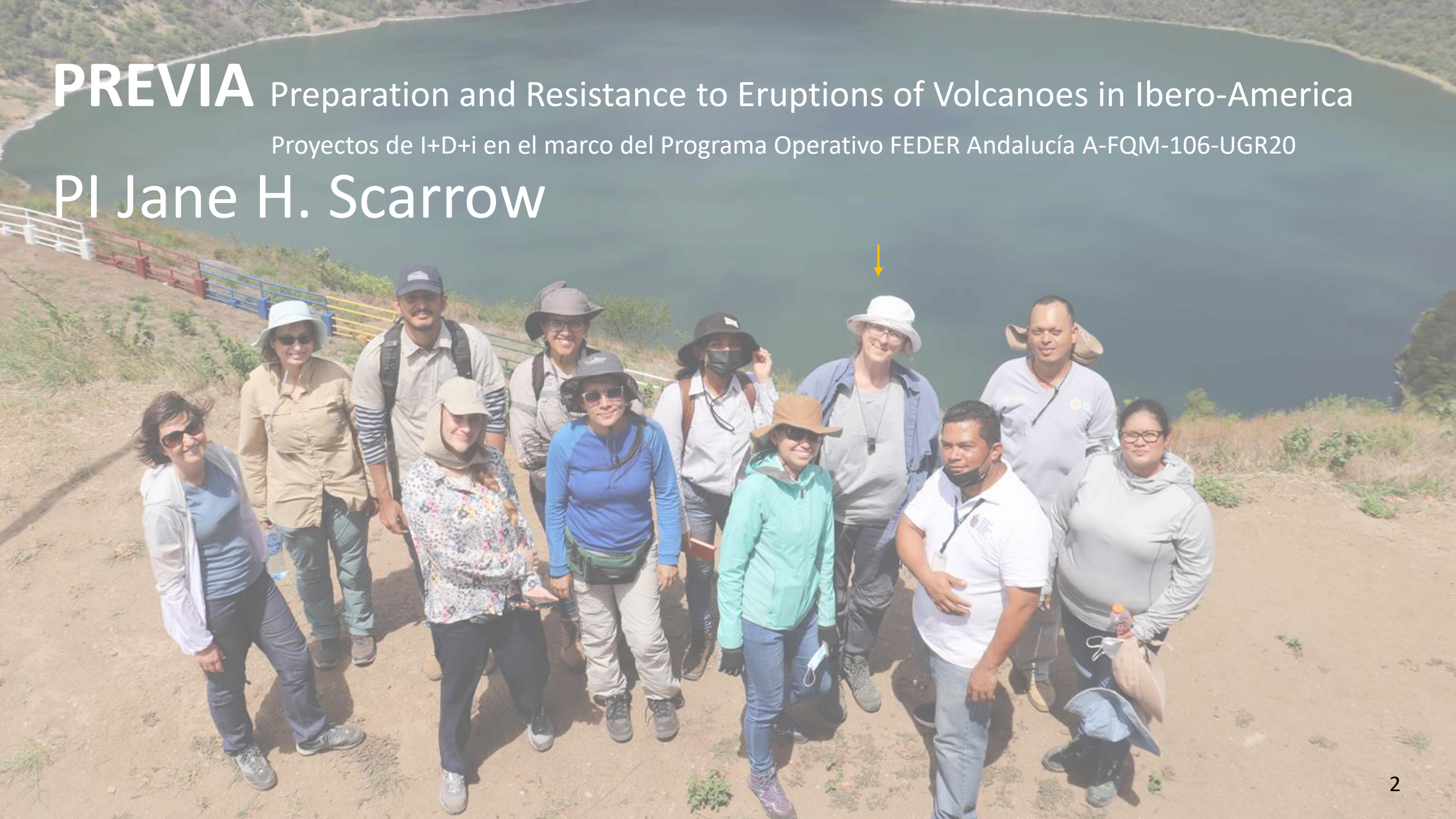
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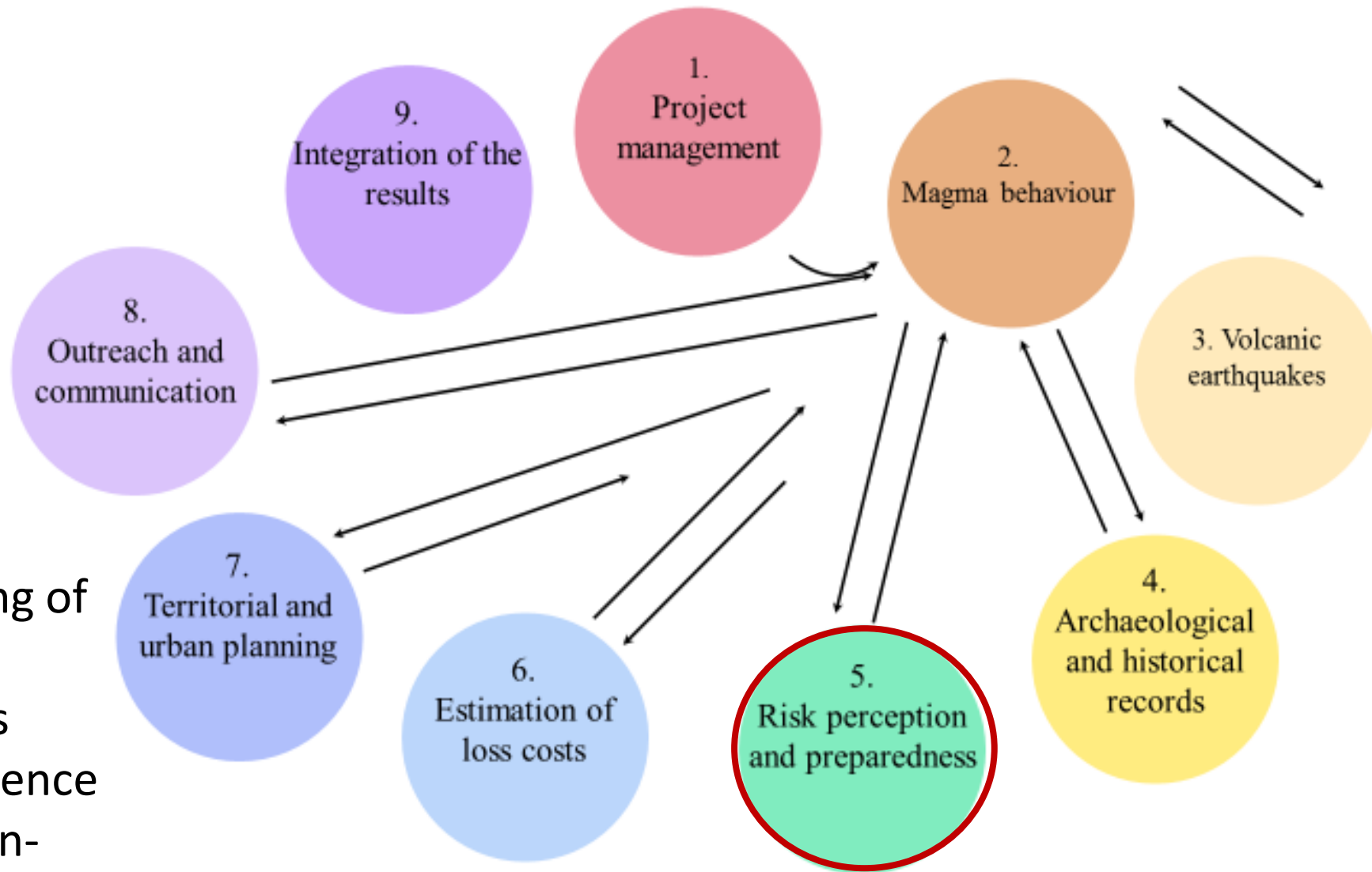
PREVIA Preparation and Resistance to Eruptions of Volcanoes in Ibero-America

Proyectos de I+D+i en el marco del Programa Operativo FEDER Andalucía A-FQM-106-UGR20

PI Jane H. Scarrow



PREVIA interdisciplinary project



Evaluation and monitoring of the **attitudes** of the community members is key for promoting resilience and facilitating decision-making

PREVIA

actions addressing the case of potential eruptions and activity of **Apoyeque volcano** in Nicaragua

last known eruption 50 BCE, tephrochronology, VEI 6, located ~30 km from Managua, population ~1 million

Field trip during May 2022

Country

Nicaragua

Primary Volcano Type

Pyroclastic shield

Last Known Eruption

50 BCE

Latitude

12.242°N

Longitude

86.342°W

Summit

518 m

Elevation

1699 ft

Volcano

344091

Number



Source: Global Volcanism Program (2022)

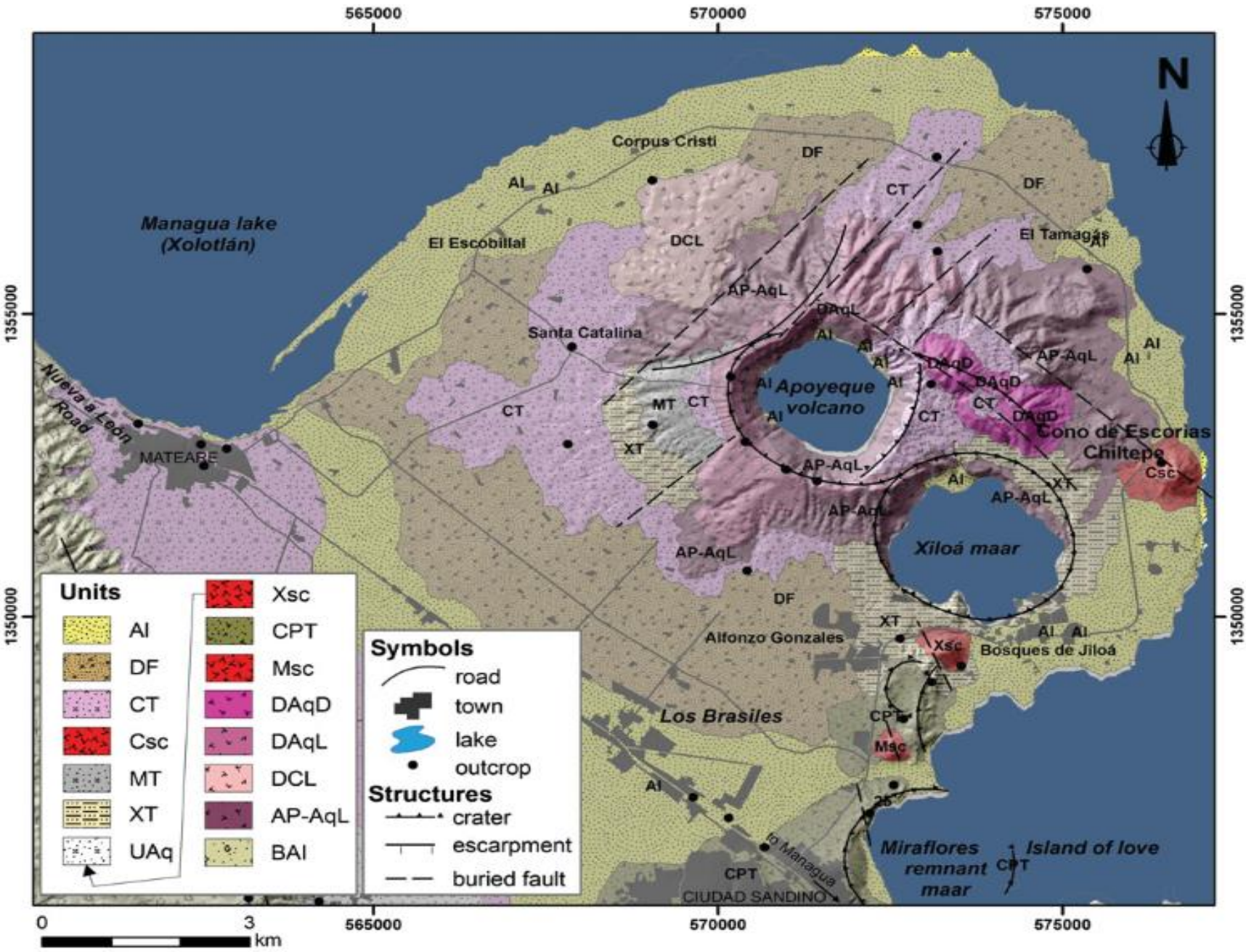


Fig. 1 Geological map of the Chiltepe Volcanic Complex

Source: Avellan et al., 2014, p.3

Key for lithology: BAI, Basaltic Andesite Ignimbrite; AP-AqL, Andesitic Pre-Apoyeque lavas; DCL, Dacitic corpus lavas; DAqL, Dacitic Apoyeque lavas; DAqD, Dacitic Apoyeque domes; Msc, Miraflores scoria cone; CPT, Cuesta El Plomo Tuff; Xsc, Xiloá scoria cone; UAq, Upper Apoyeque Tephra; XT, Xiloá Tephra; MT, Mateare Tephra; Csc, Chiltepe scoria cone; CT, Chiltepe Tephra; DF, Debris flow; and AI, alluvia

Method

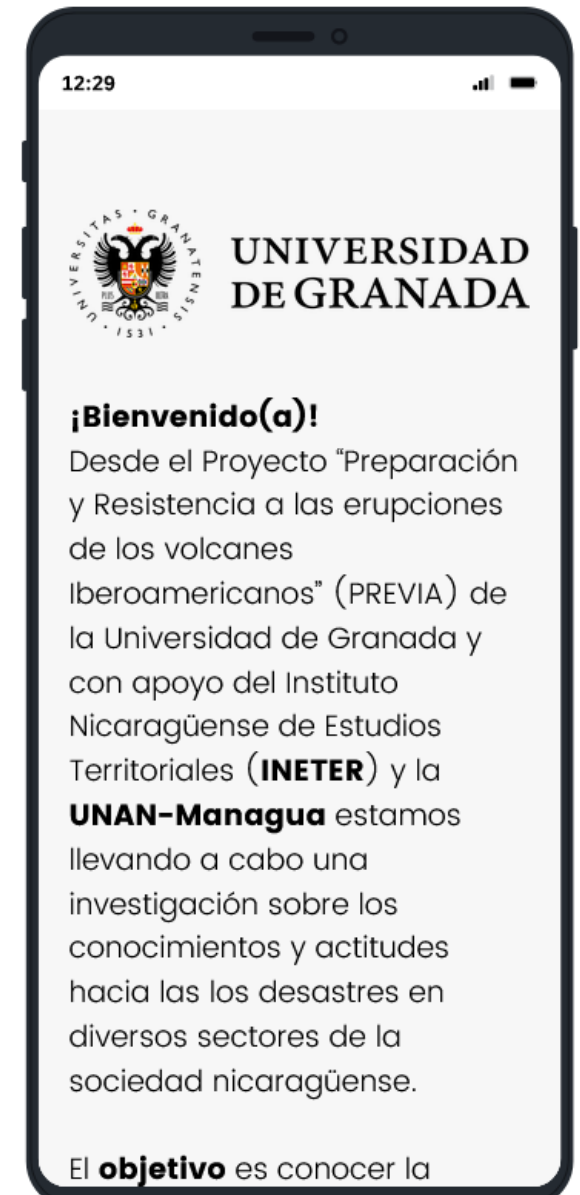
Aim

Explore perception attitudes and sense of preparedness in the case of a volcanic eruption scenario of Apoyeque

Participants

N=204 (111 women, $M_{age}=30.68$; $SD=13.39$)

Online survey released in collaboration with INETER, CIGEO and UNAN-Managua



Measures

Self report scales

Perception

Do you consider that you live in a volcanic risk area?



Yes/No

Do you think the community institutions are prepared to face an eruption of the Apoyeque?



Select option

You think a possible eruption of the Apoyeque would be:

Preparedness

How capable do you feel in

i.e. Assisting in the recovery process

0 (Not capable at all) to
3 (Completely capable)

Measures

Adapted version of **Psychological Preparedness for Disaster Threat Scale** (PPDTS; McLennan et al., 2020)

10-item **Knowledge and Management** (KM) of external situational environment i.e. *“I am aware of the disaster alert system messages that are used for emergency situations”*.

8-item **Anticipation, Awareness and Management** (AAM) one’s psychological response. *“I can predict clearly how I would respond in an emergency situation”*

Two likert-type sub-scales
0 (*Completely disagree*) to 3
(*Completely agree*)

Sociodemographics and comments

Results



30% knows the local plans in a volcanic emergency scenario



58% believe local authorities are *not* prepared to manage an eruption of Apoyeque



88% would like to receive training in volcanic risk management

Risk Perception



47% believe they live in a volcanic risk area



67% consider it possible that Apoyeque will have an eruption at any moment



40% think that this eruption will be of a significant impact

Psychological Preparedness for Disaster Threat

Sub-scales	Mean (SD)	α Total .93
Knowledge and Management (KM)	1.80 (.73)	.91
Anticipation, Awareness and Management (AAM)	2.20 (.67)	.94

T-test Participants displayed significantly higher scores for AAM than for KM ($t(193)=6.45; p < .001$)

This suggests a tendency to rely more strongly on their own psychological response rather than on the knowledge and preparation strategies to manage the environment

Conclusions

- Piloting of the survey and adaptation of PPDTs (good internal consistency)
- *Identification of Perceptions*: little knowledge, low levels of confidence in authorities' response, medium risk of volcanic activity. Differentiated response in AAM and KM.
- Community interest in training and knowledge.

Limitations: online surveys target, close questions.

Future research: analysis of the whole sample (620 people) and integration with other components of the project. Complementary approaches (i.e. interviews), another field visit.



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References

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