

International Symposium on Earthquake and Tsunami Disaster  
Mitigation in Latin America  
Tokyo, Japan, March 2014.



Instituto de Geología y Geofísica IGG-CIGEO  
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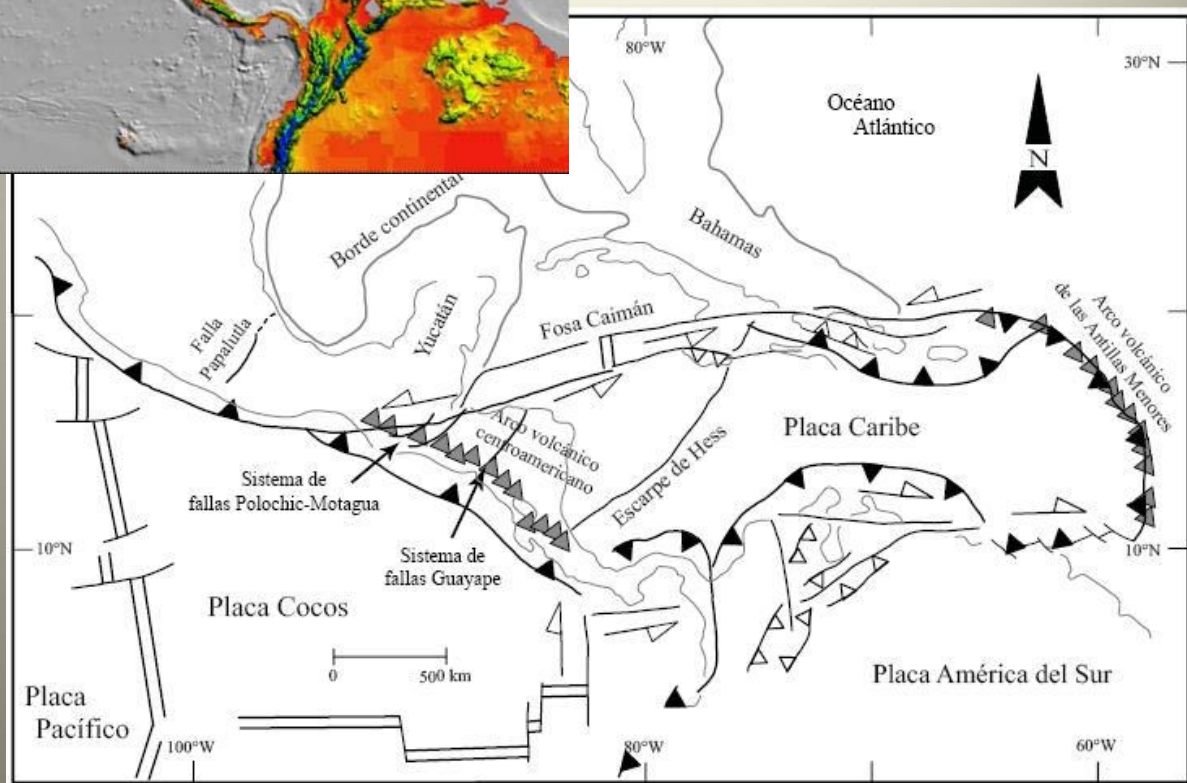
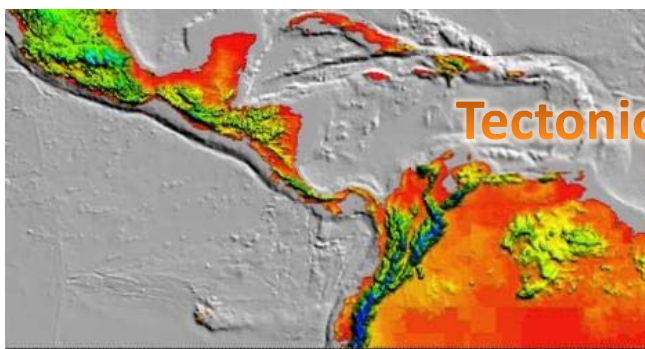
Earthquake Disaster Mitigation  
Research in Managua, Nicaragua



Managua 1972

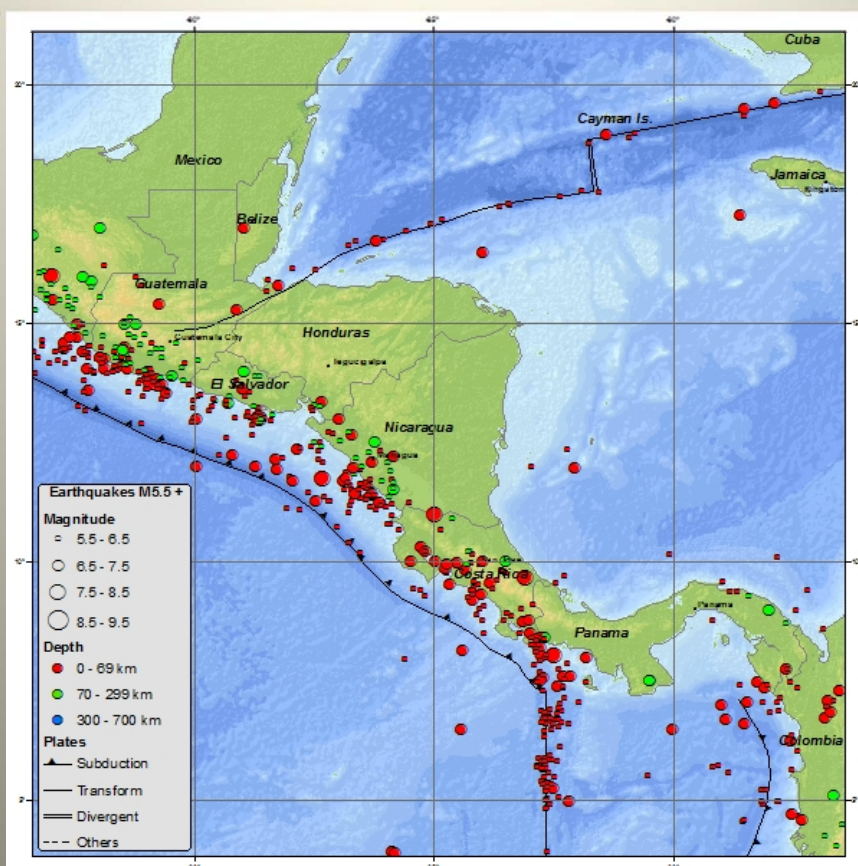


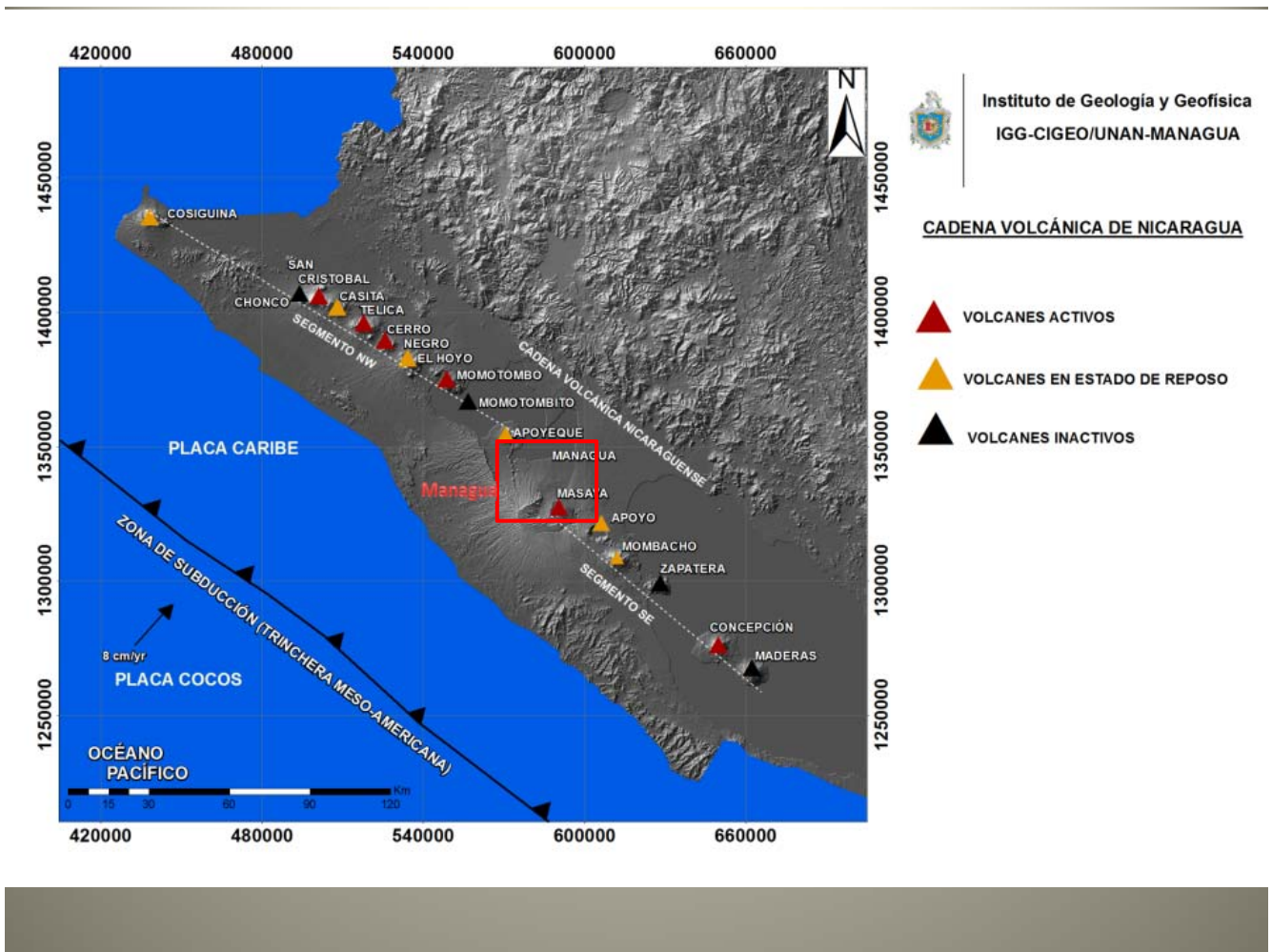
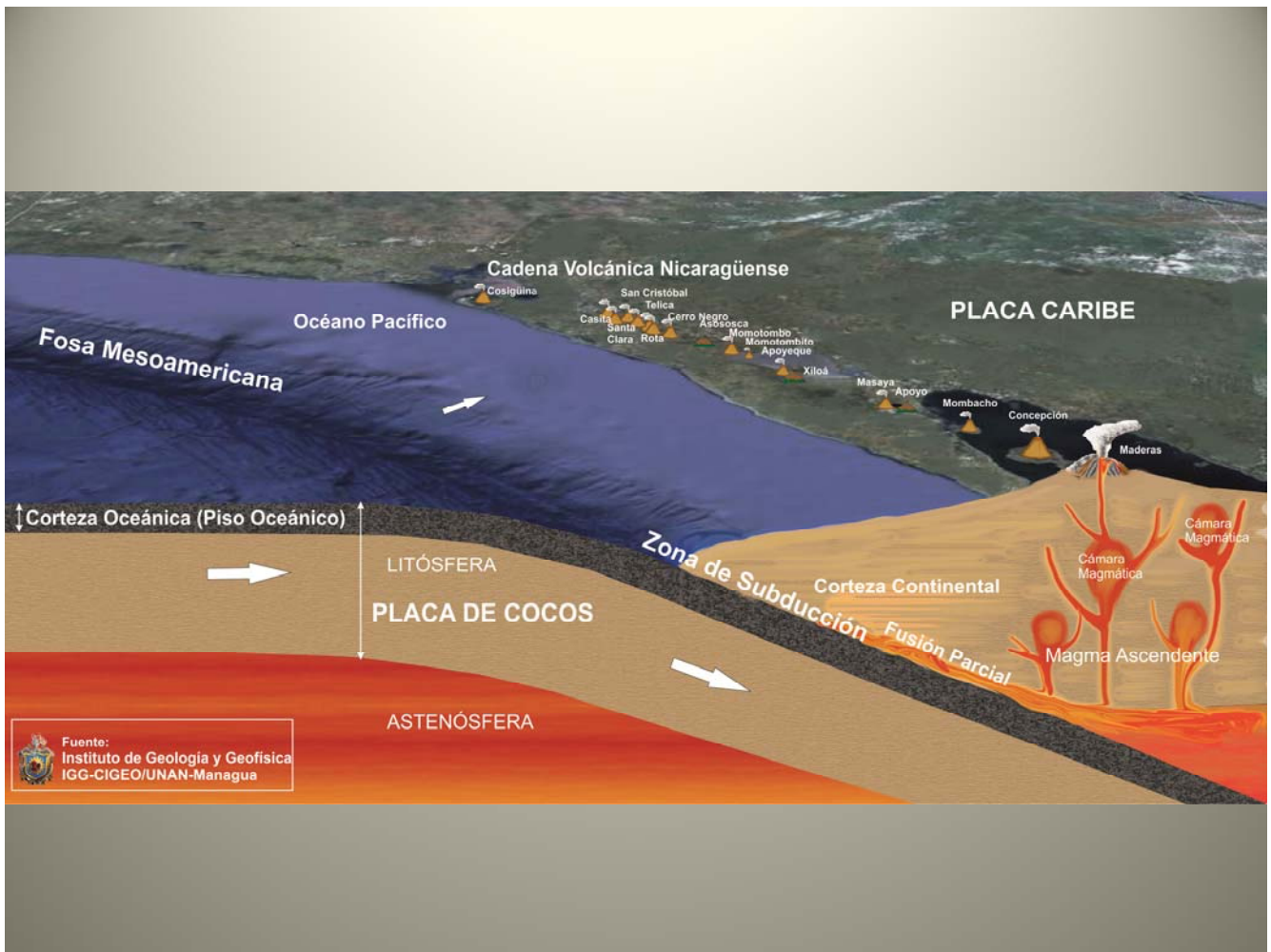
## Tectonic Frame of Central America

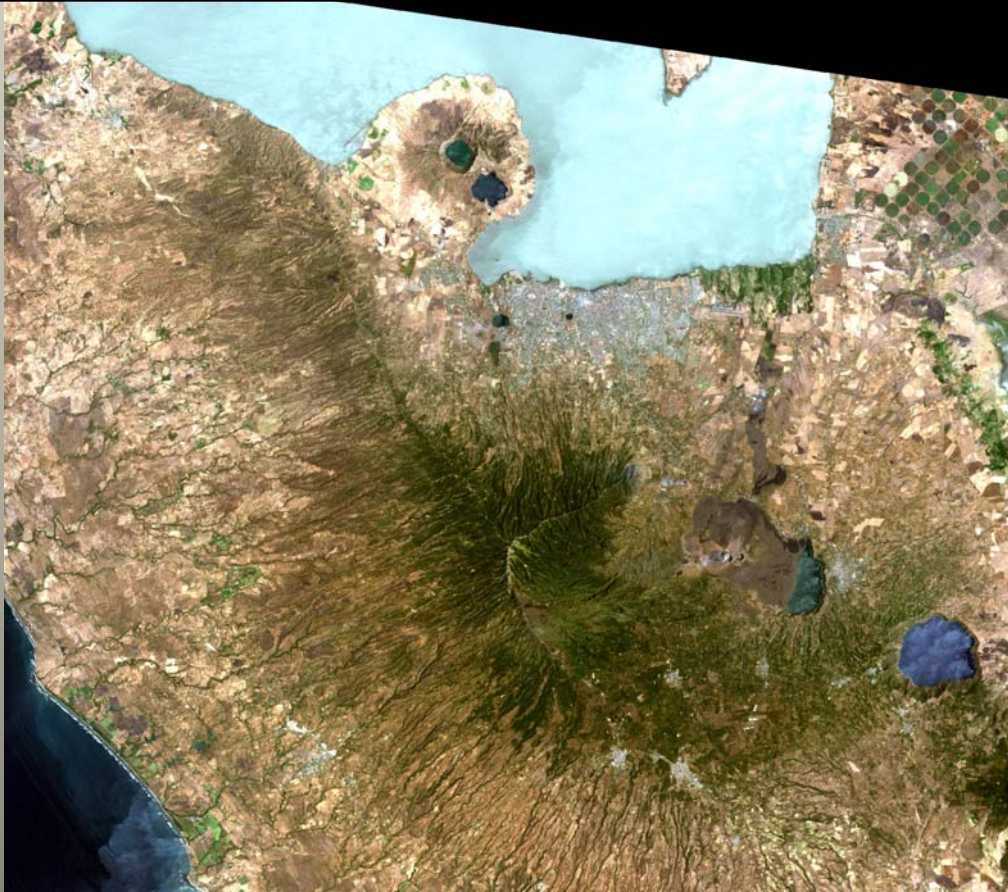


Dengo & Case, 1990

## Major Earthquake of Central America: 1990-March 2014







## Antecedents

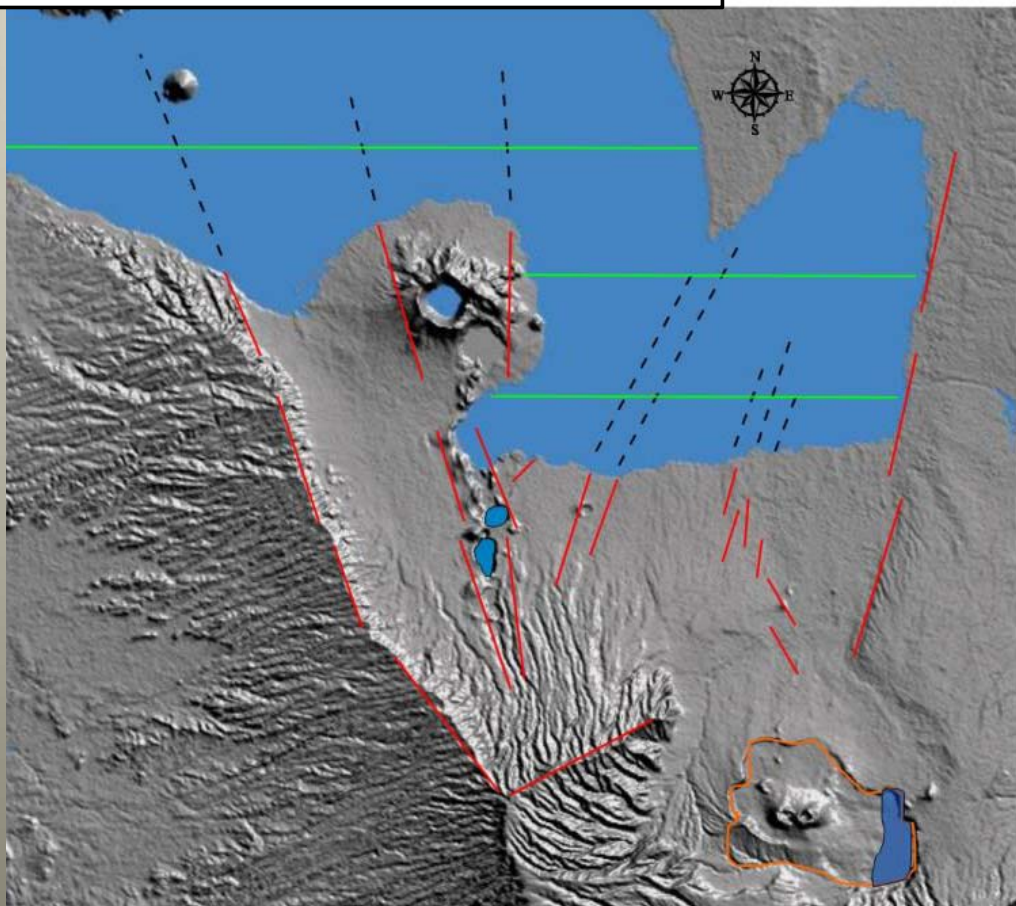
The main geological risks in Managua are the following:

- Fault rupture
- Dynamic tectonic-structural environment (earthquakes)
- History of destructive earthquakes
- The geological features of Managua are suitable for earthquake occurrence

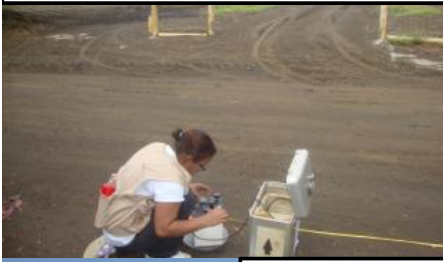
# Main goals of the applied research

- To create a geological-structural model for Managua
- To contribute to up-to-date the land use plans for Managua according to the geological conditions of the area
- To contribute by assessing geological risks to reduce disasters in Managua

Active faults studies in Managua



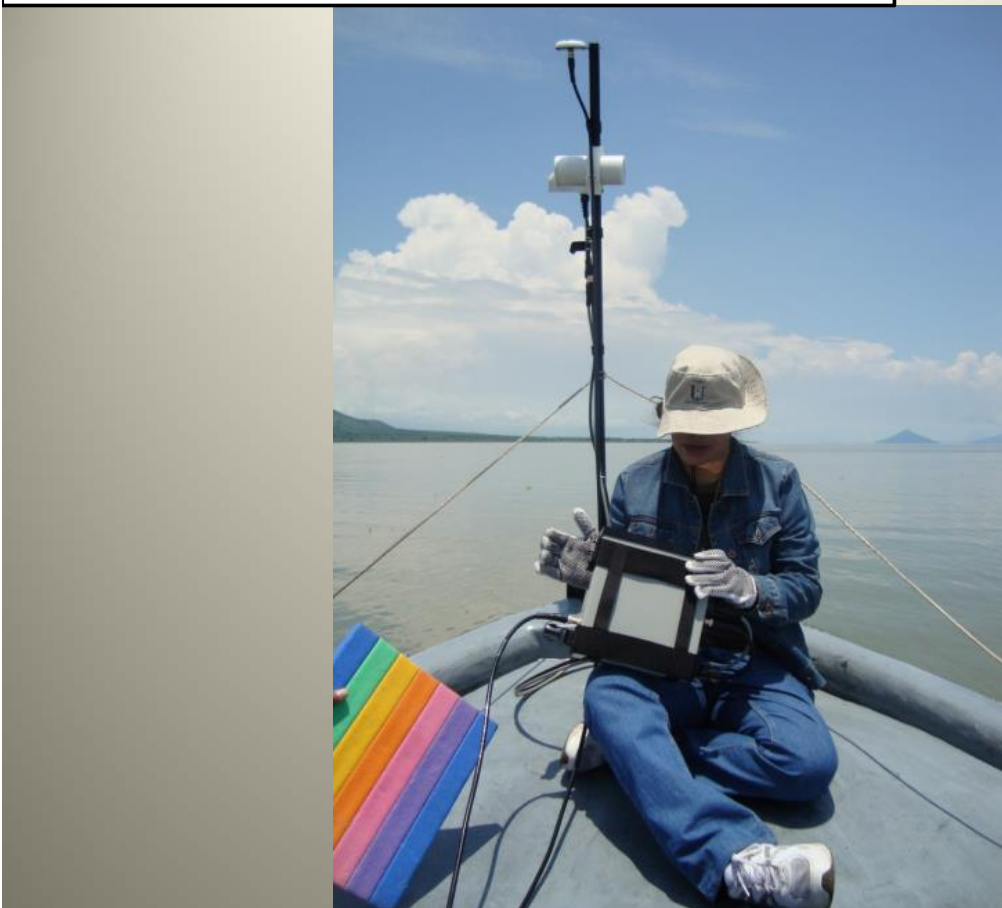
# RESEARCH METHODS



## Gravity and Magnetometry



## Active faults studies in the Lake of Managua





Electrical Tomography



Georadar (GPR-Ground Penetration Radar)



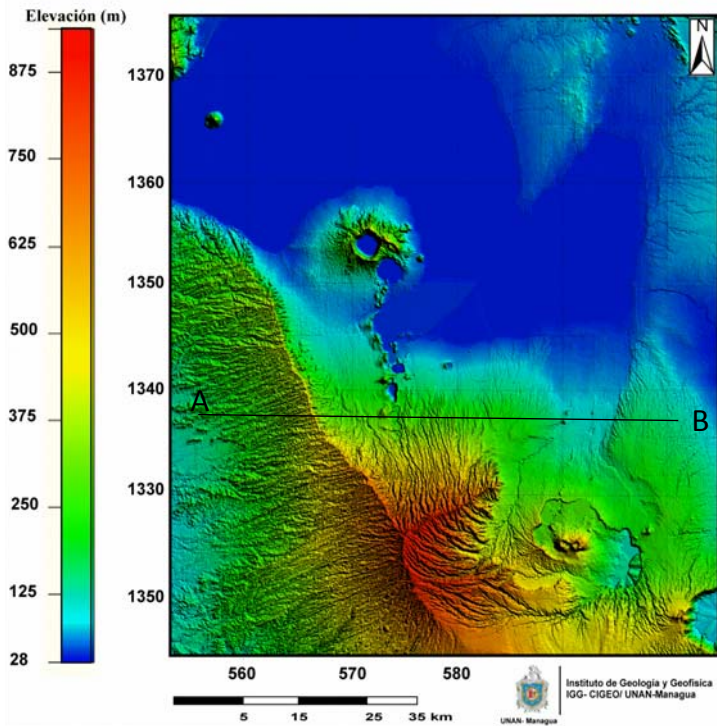
## Exploration Trenches



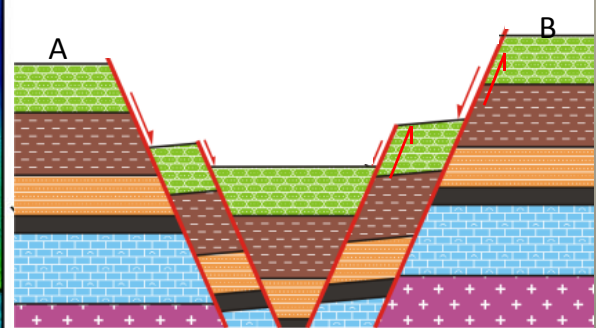
## Drilling Core Test



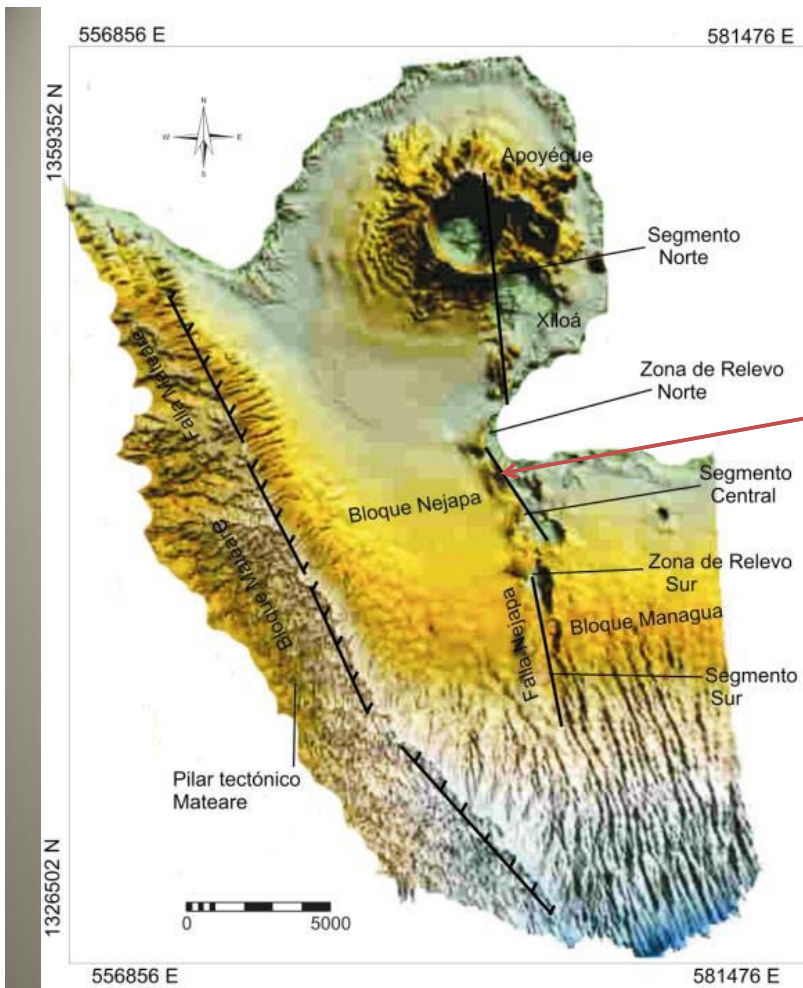




## Managua Graben?



Graben is a geological structure limited by normal faults. It is basin filled with sediments and volcanic materials between the two uplifted blocks.



### Nejapa Fault

- Length: 32km
- Direction: N-S

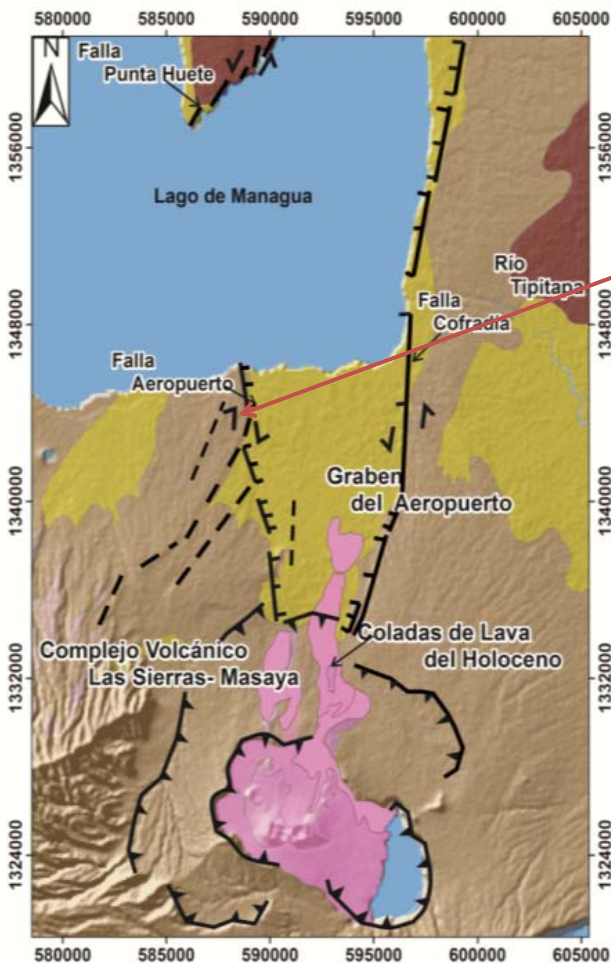


**Tiscapa Fault**

- Length: 5.8km
- Direction: NE-SW y N-S

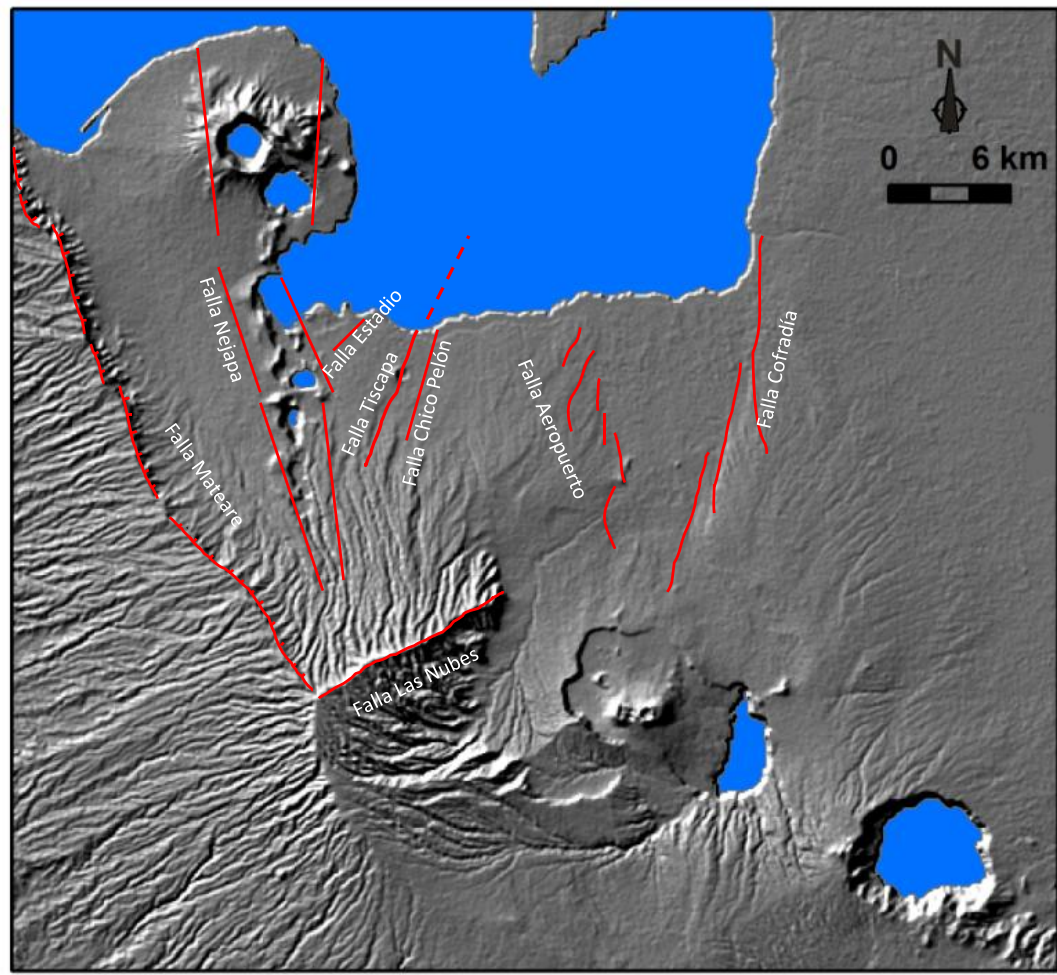
**Chico Pelón Fault**

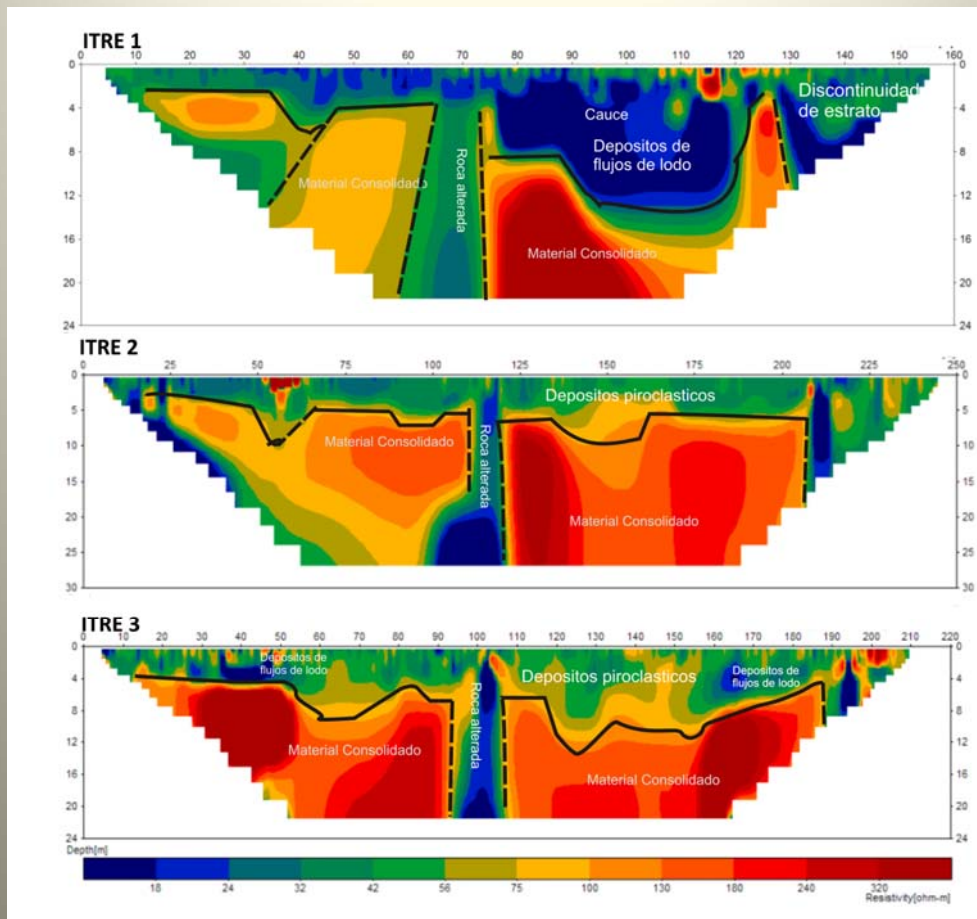
- Length 4.9km
- Direction: NE-SW



**Aeropuerto Fault**

- Length: 3.4km
- Direction: N-S

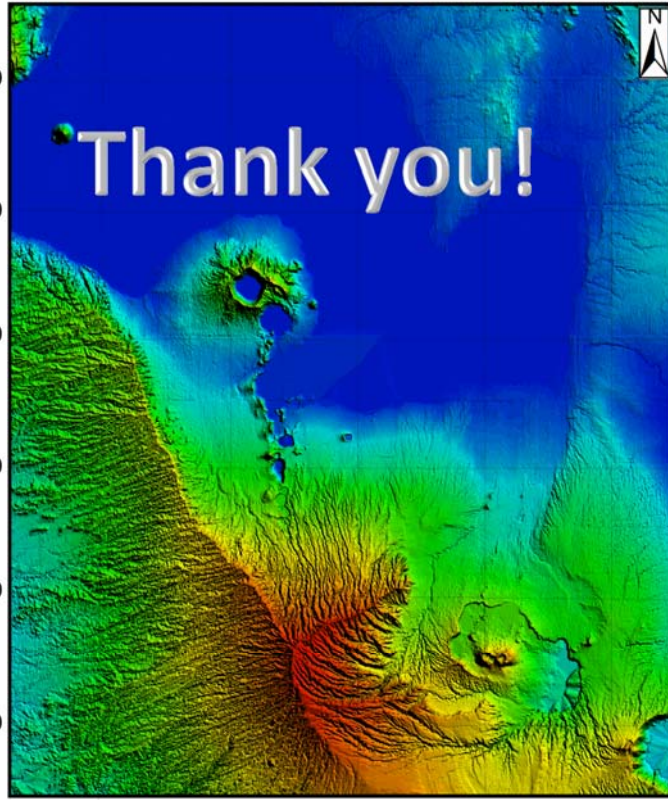
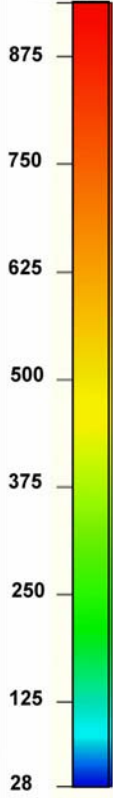




## Conclusions

- We are characterizing the behavior of the active faults in Managua
- Combining geological and geophysical methods have been helpful to investigate geological structures in depth.
- In order to complement these studies, it is necessary to build a geological-structural model of Managua
- It is also needed to continue with seismic microzonation studies in Managua

Elevación (m)



Thank you!



UNAN- Managua

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Modelo Digital de Elevación Managua

