



COORDINACIÓN NACIONAL DE  
PROTECCIÓN CIVIL  

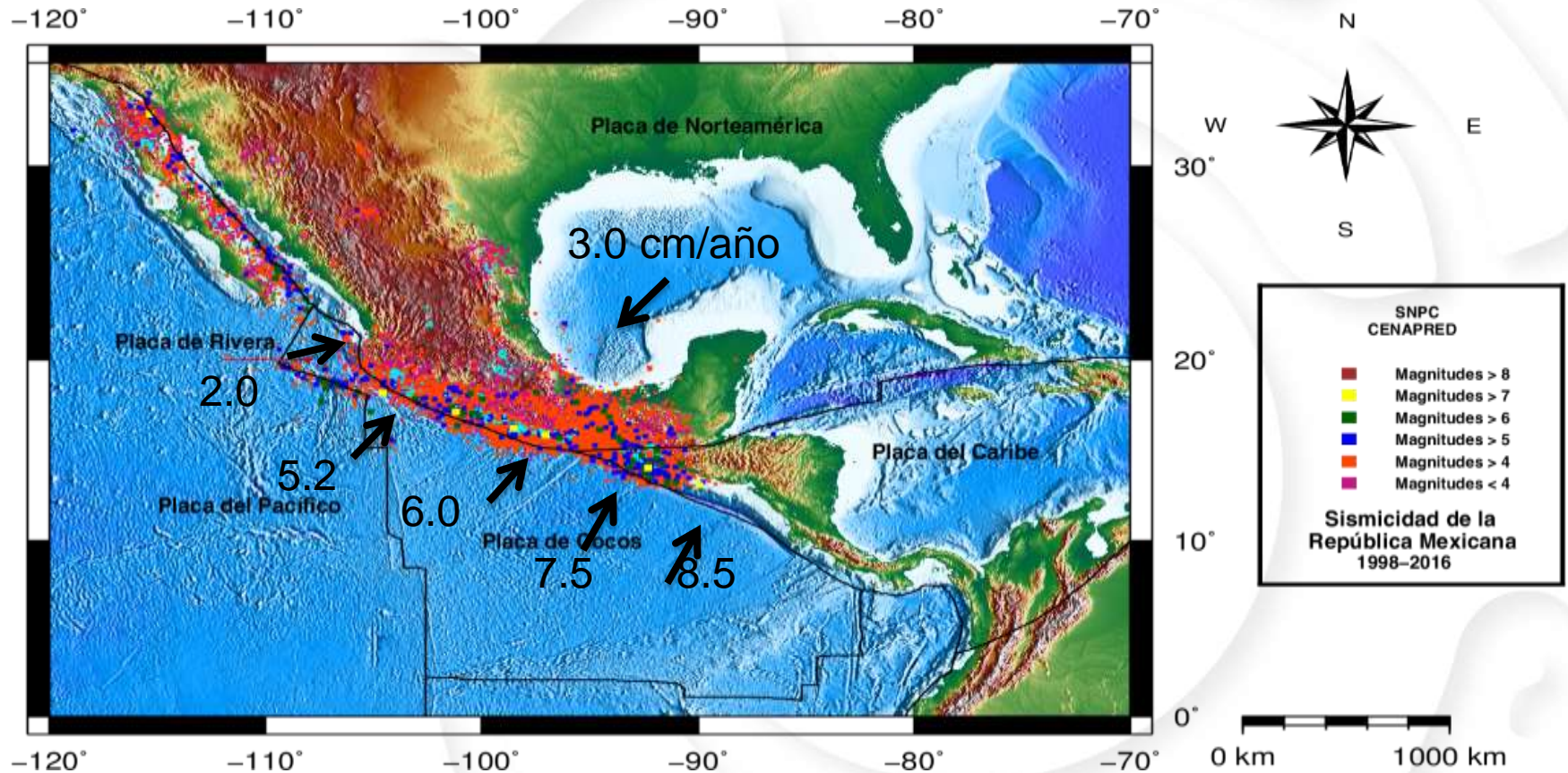
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**MÉXICO**

“EL SISMO DE MORELOS-Puebla: Características e Implicaciones en  
EL CENTRO DE MÉXICO”

13 de septiembre 2018

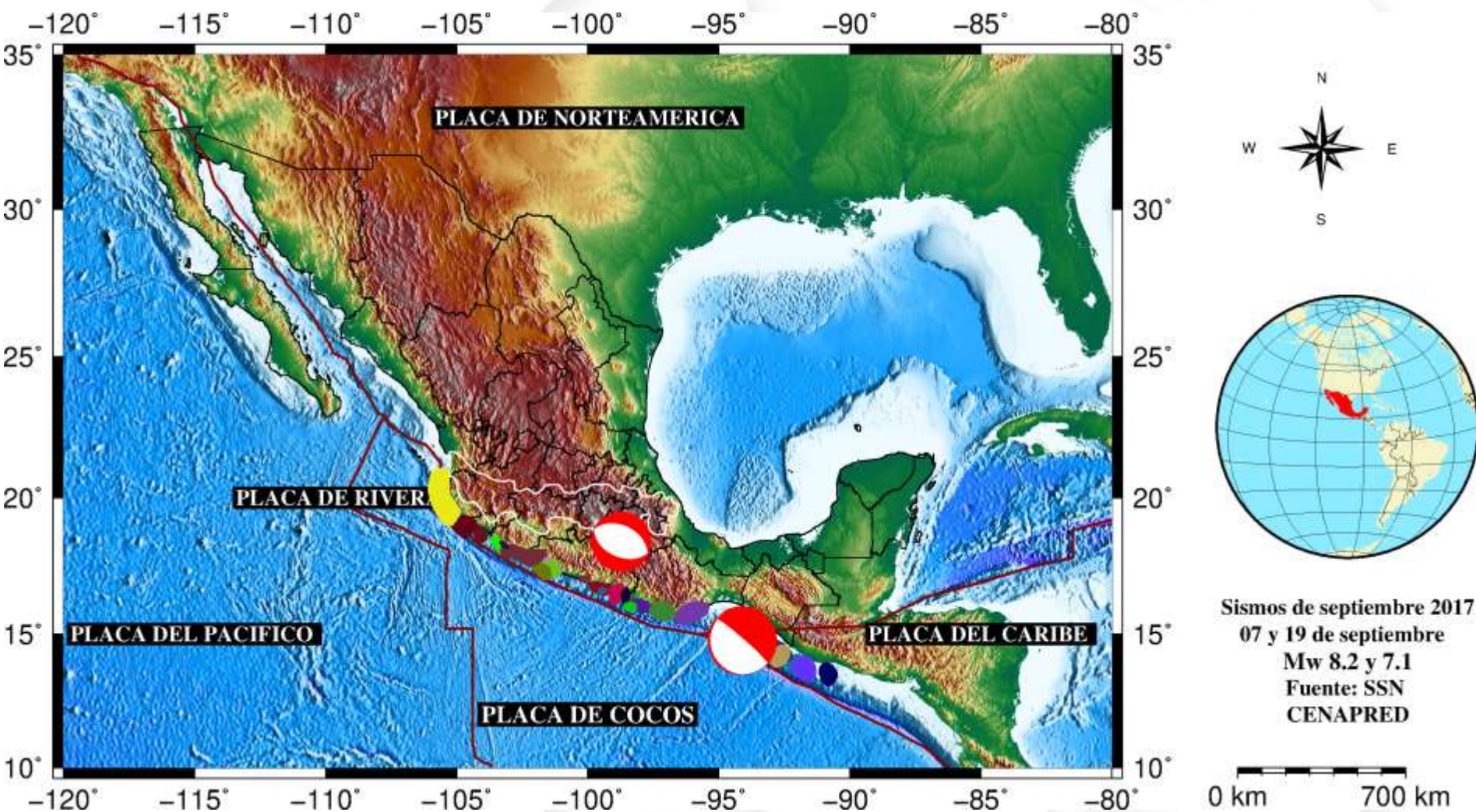
## Tectónica y Sismicidad de México



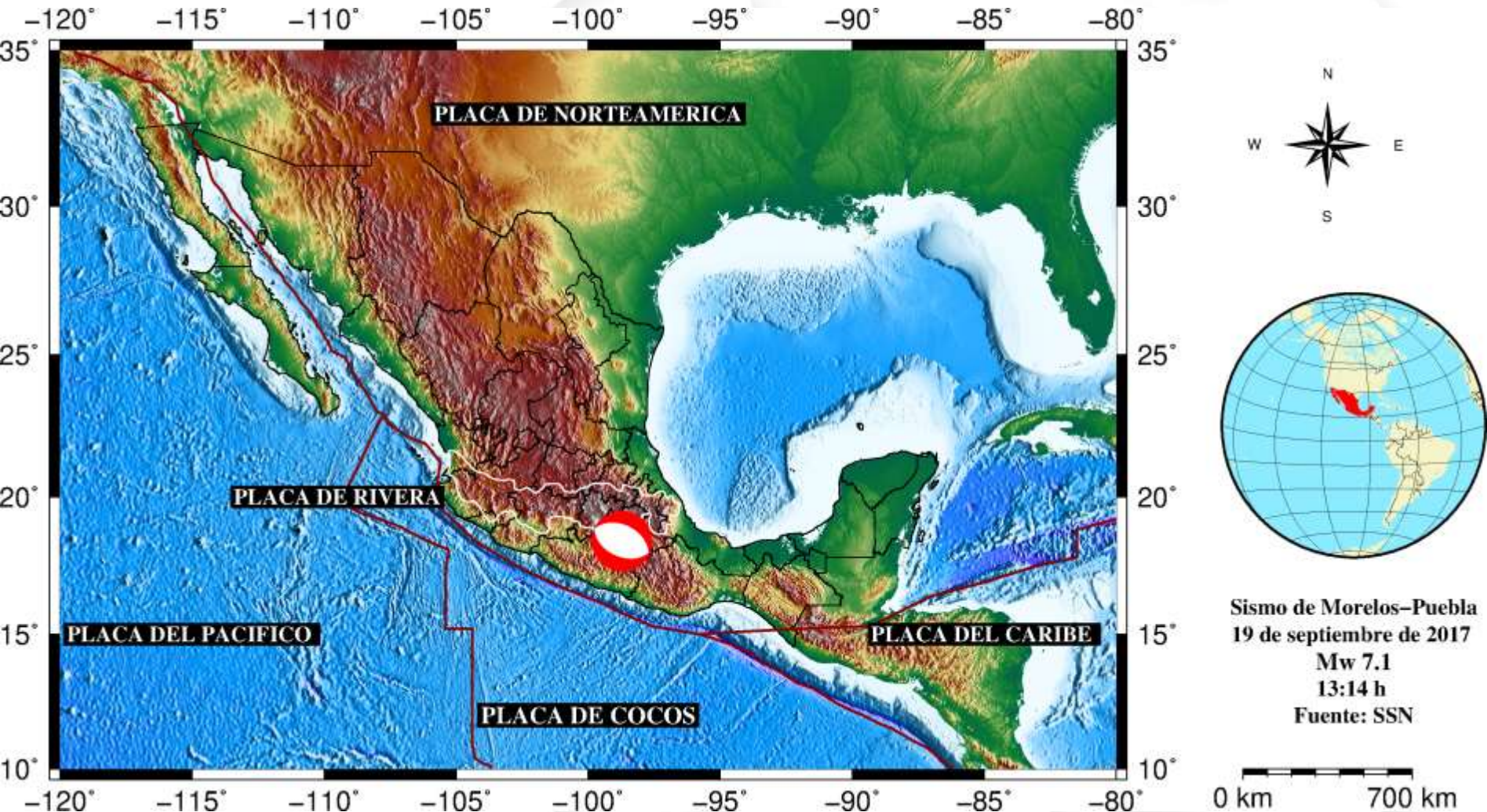
Población 112,336,538 en 2010 (INEGI)

Fuentes: SSN, USGS y NOAA

## Los sismos de septiembre de 2017

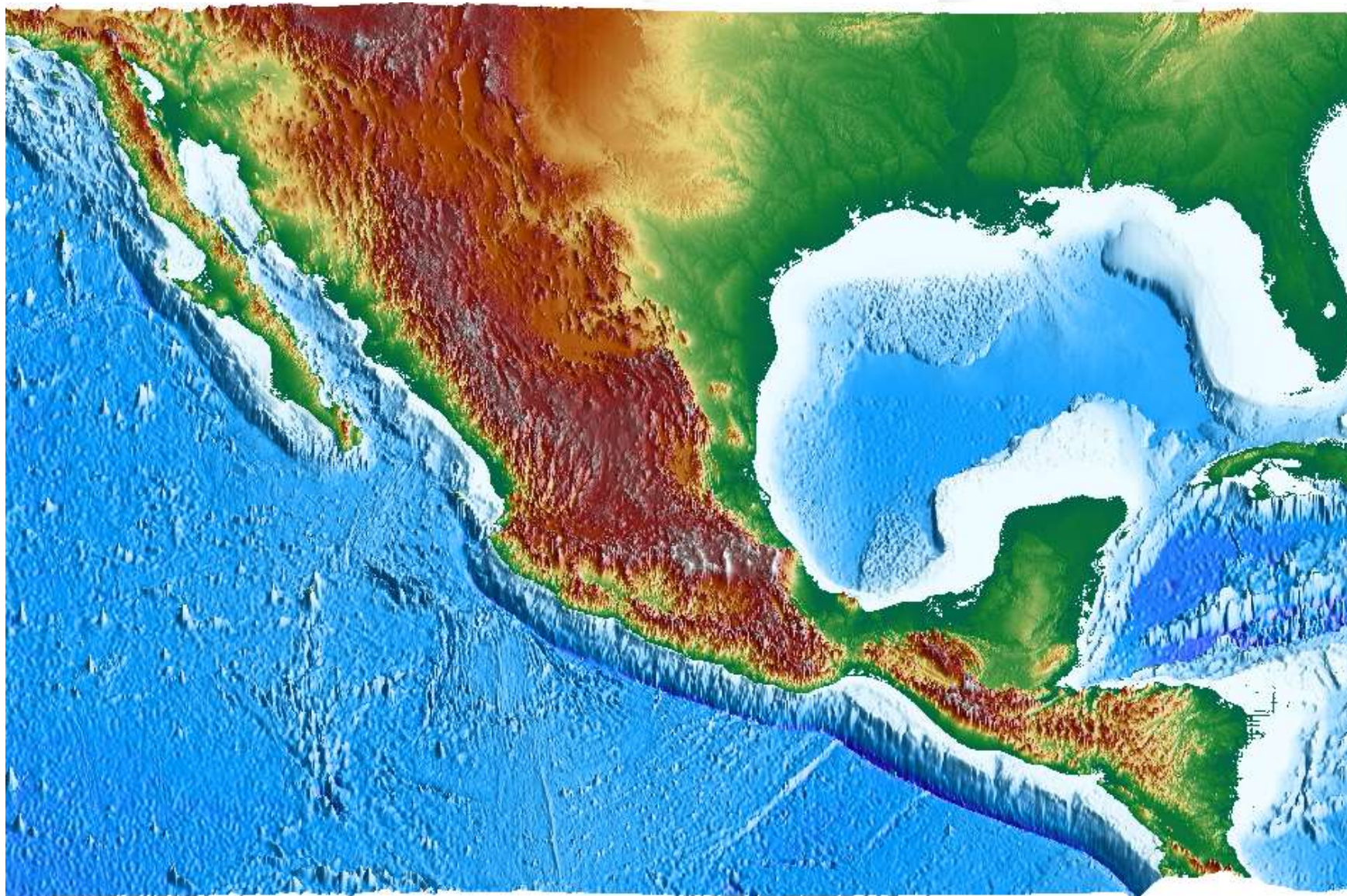


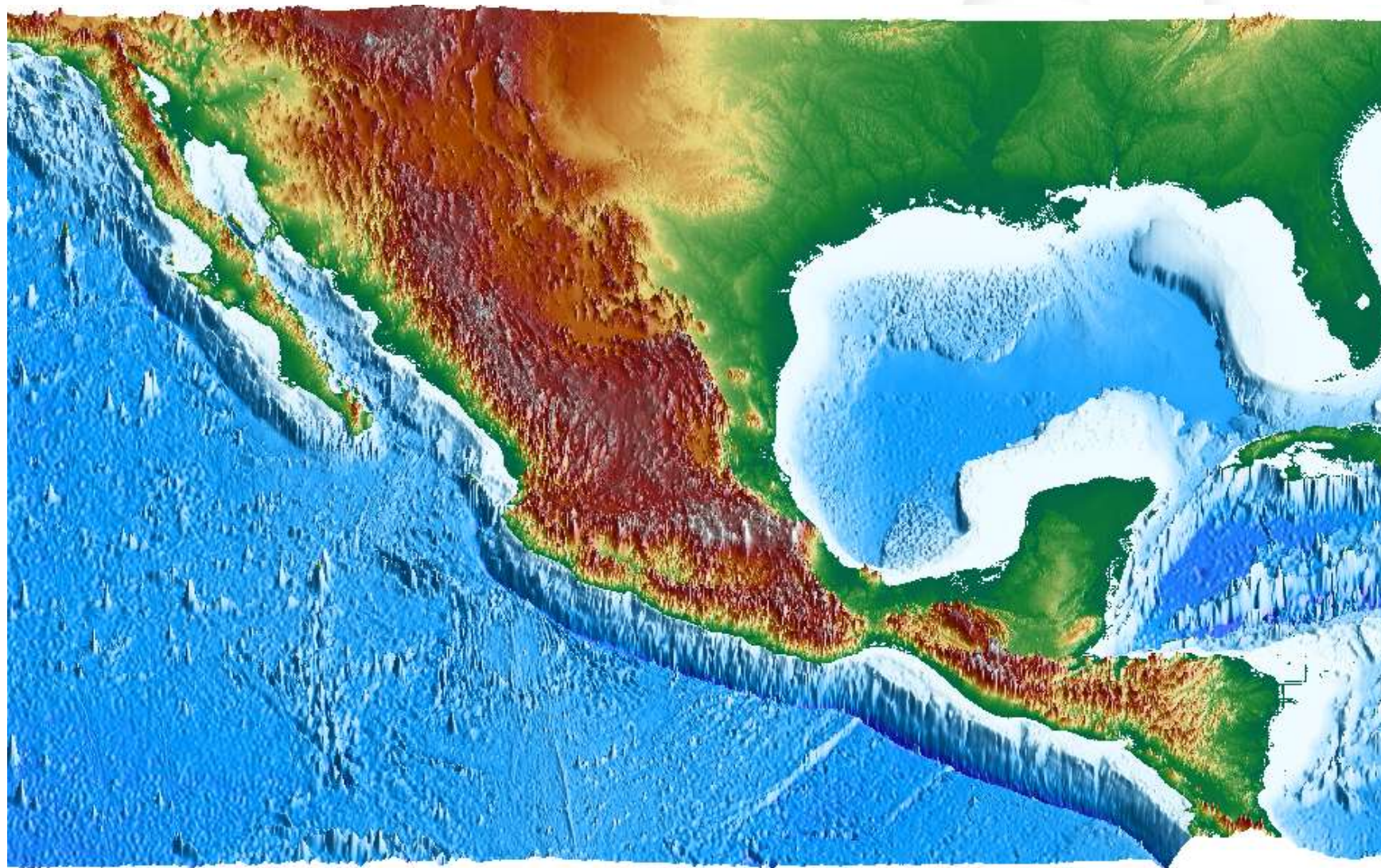
## El sismo de Morelos-Puebla a M 7.1



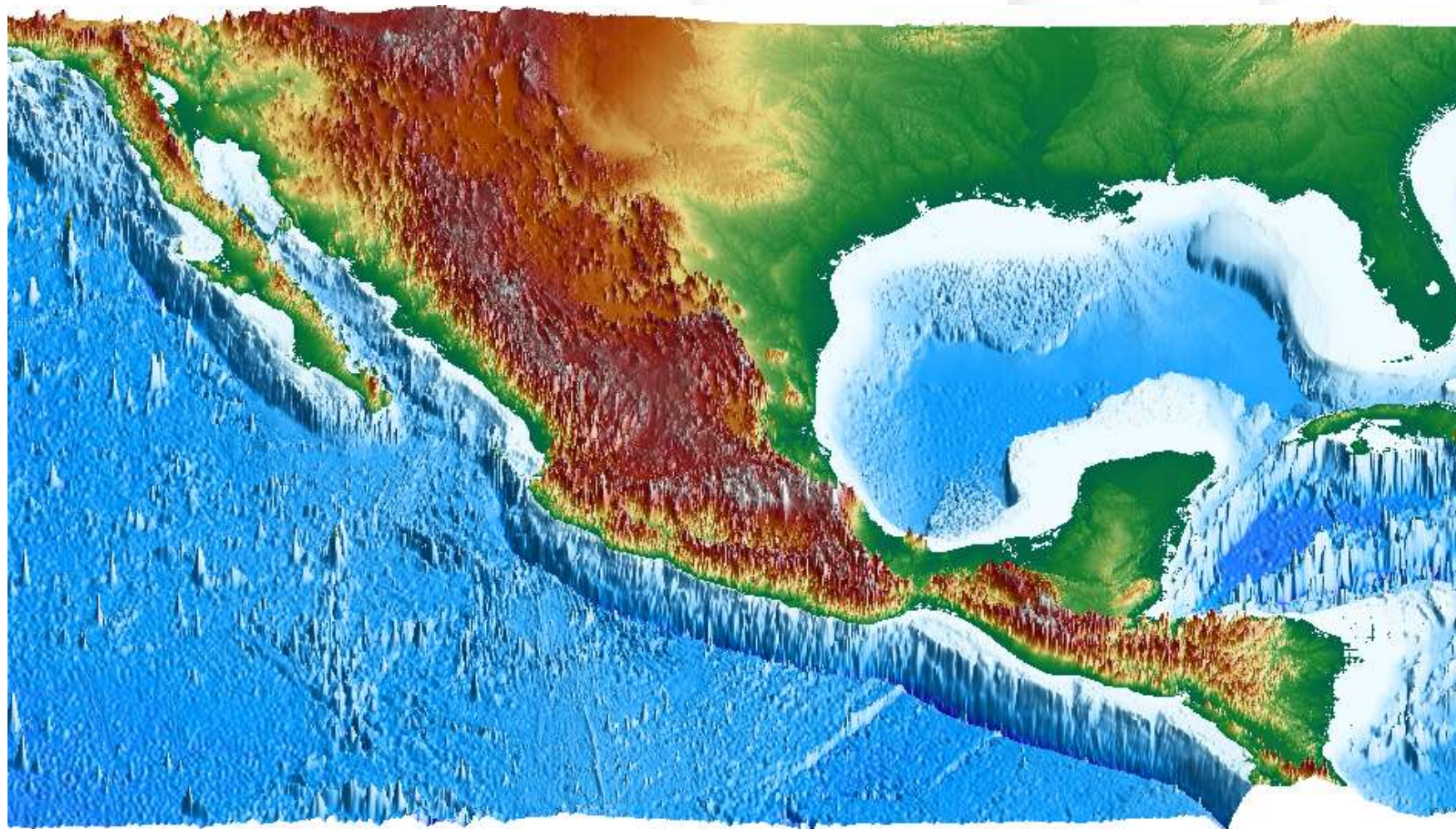


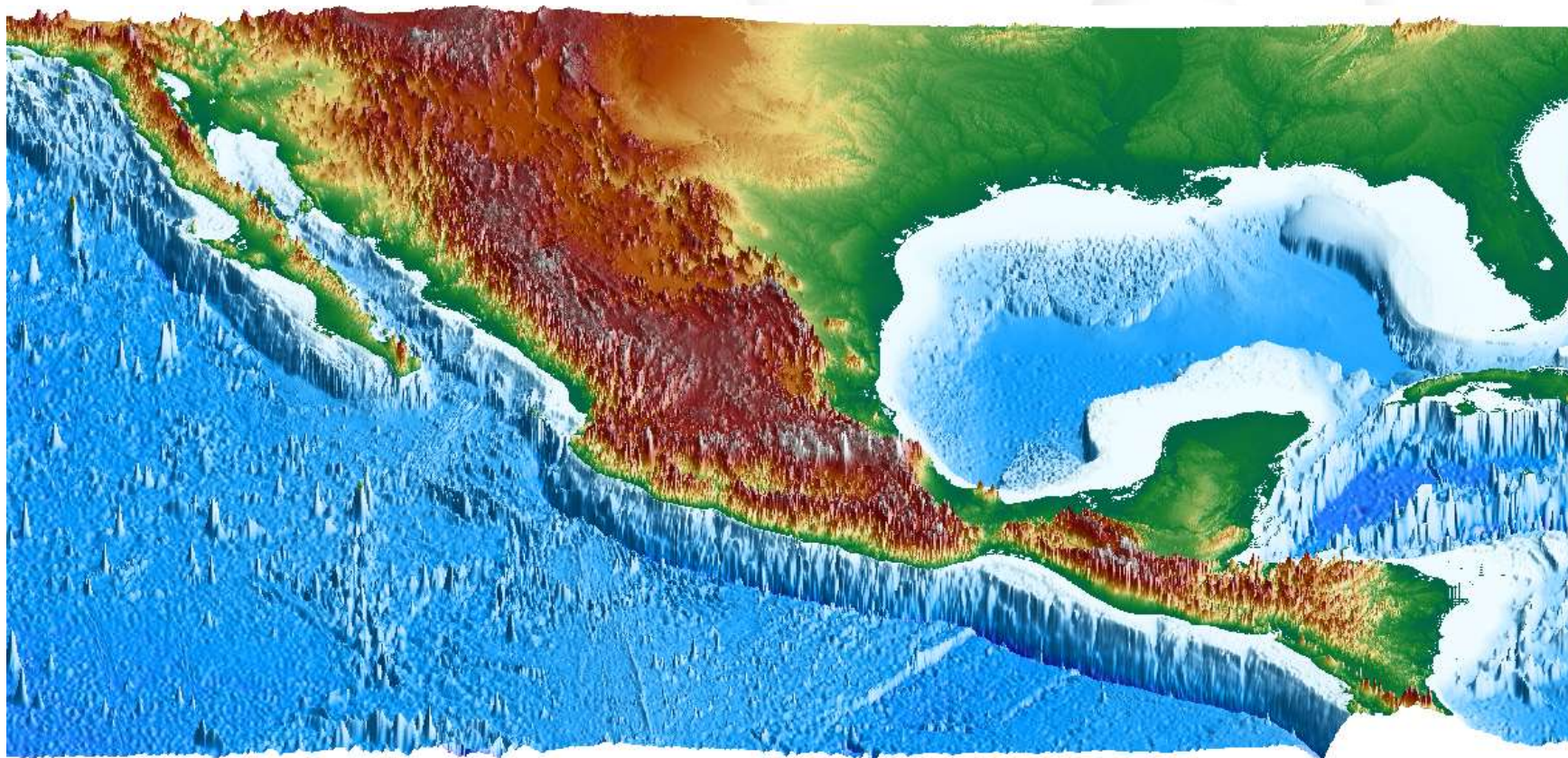


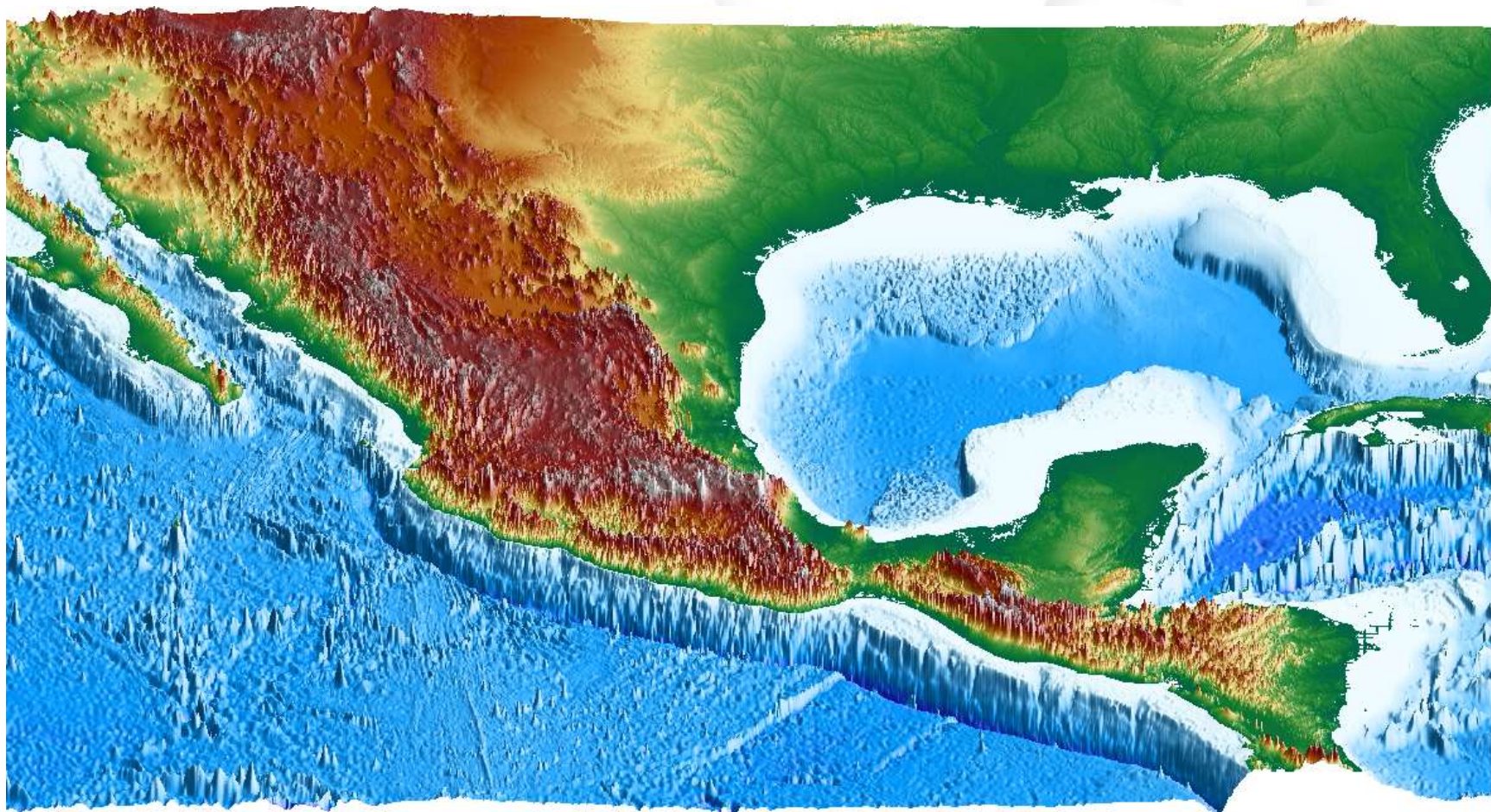


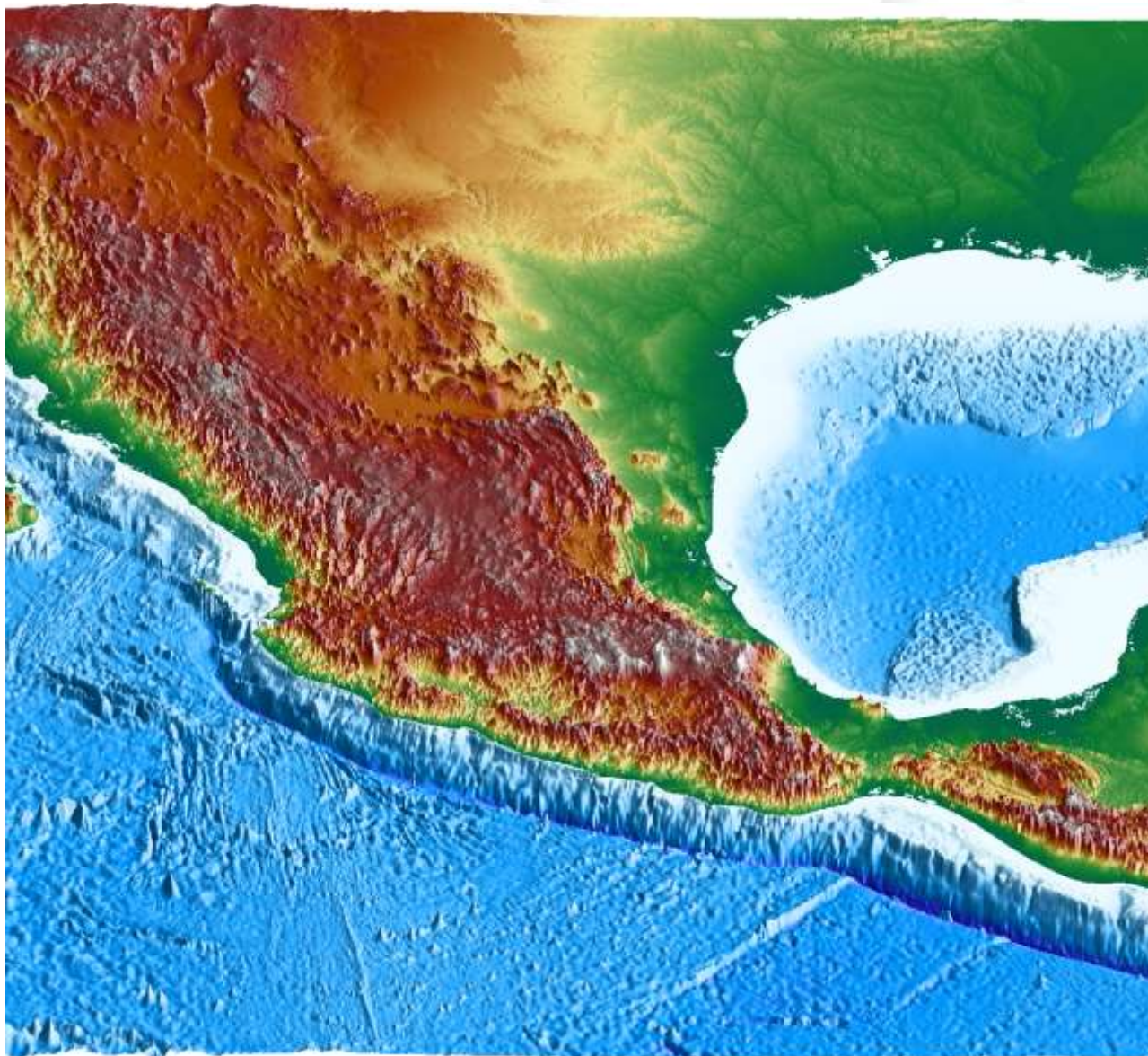


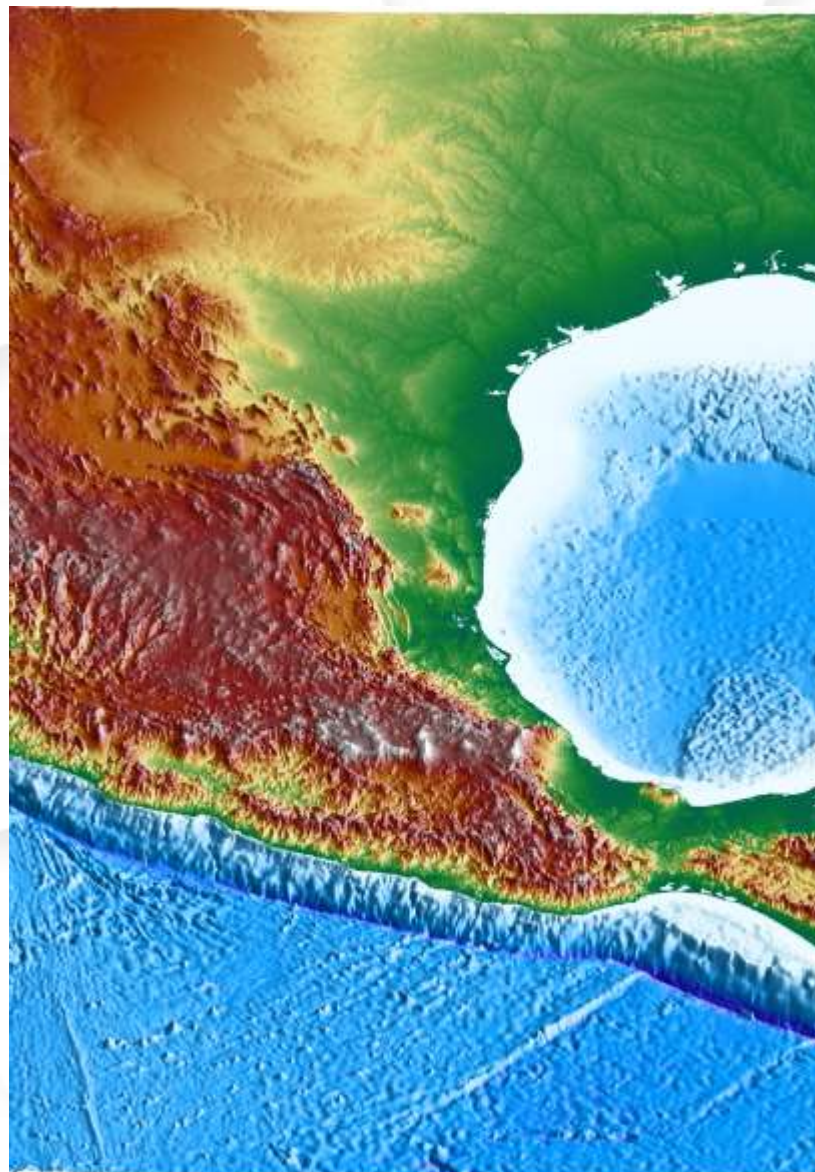




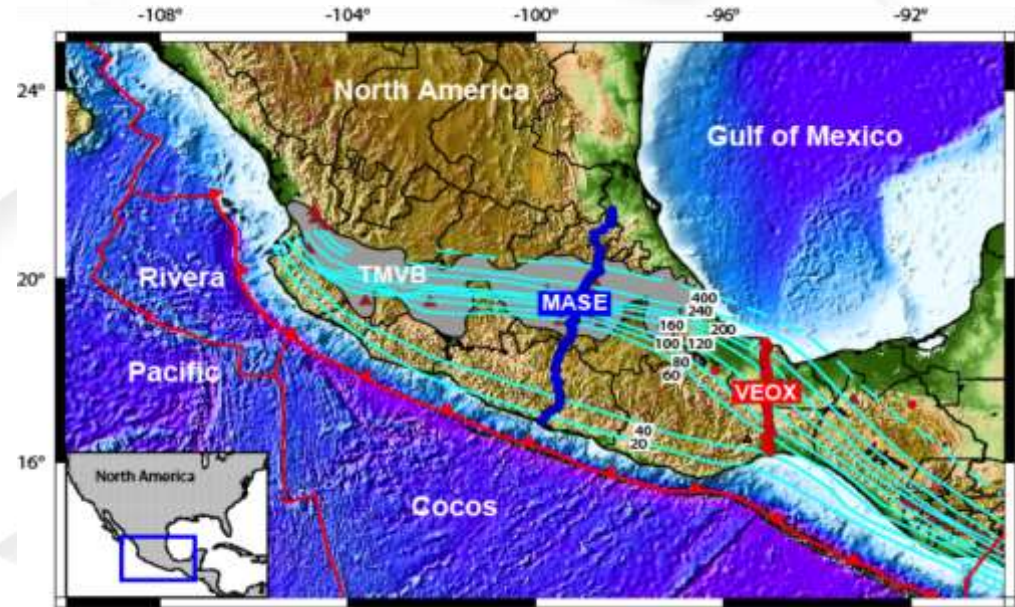
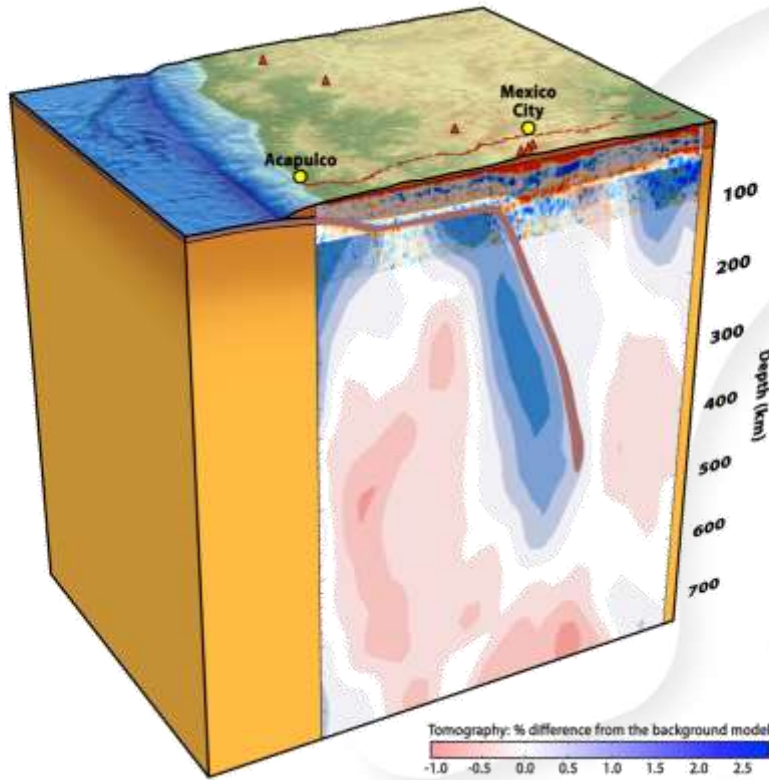








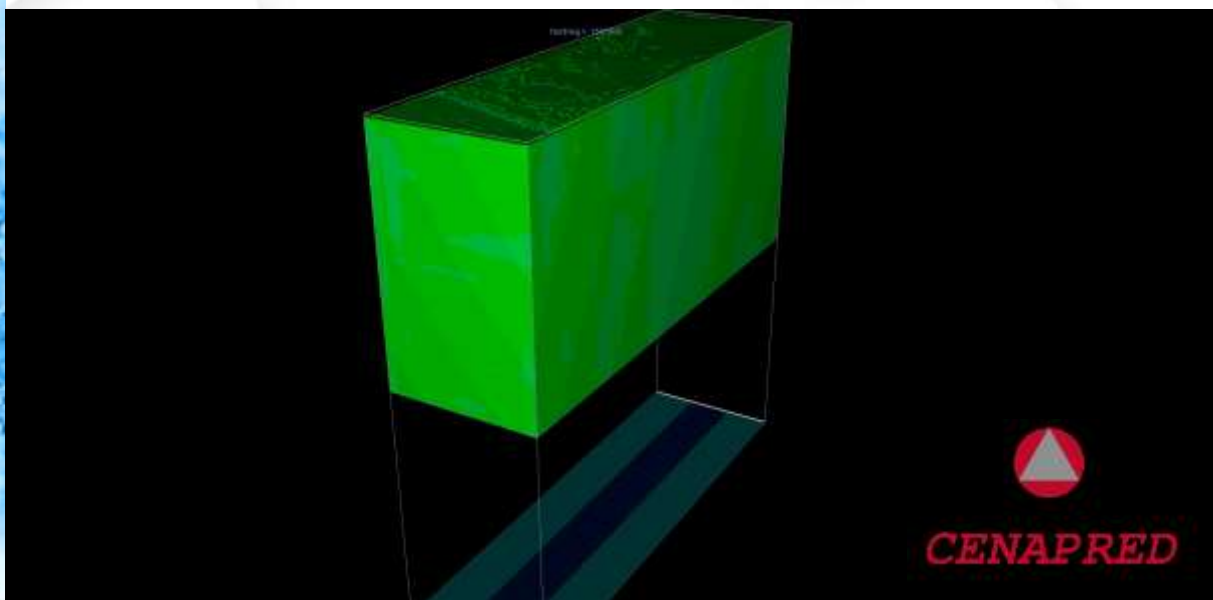
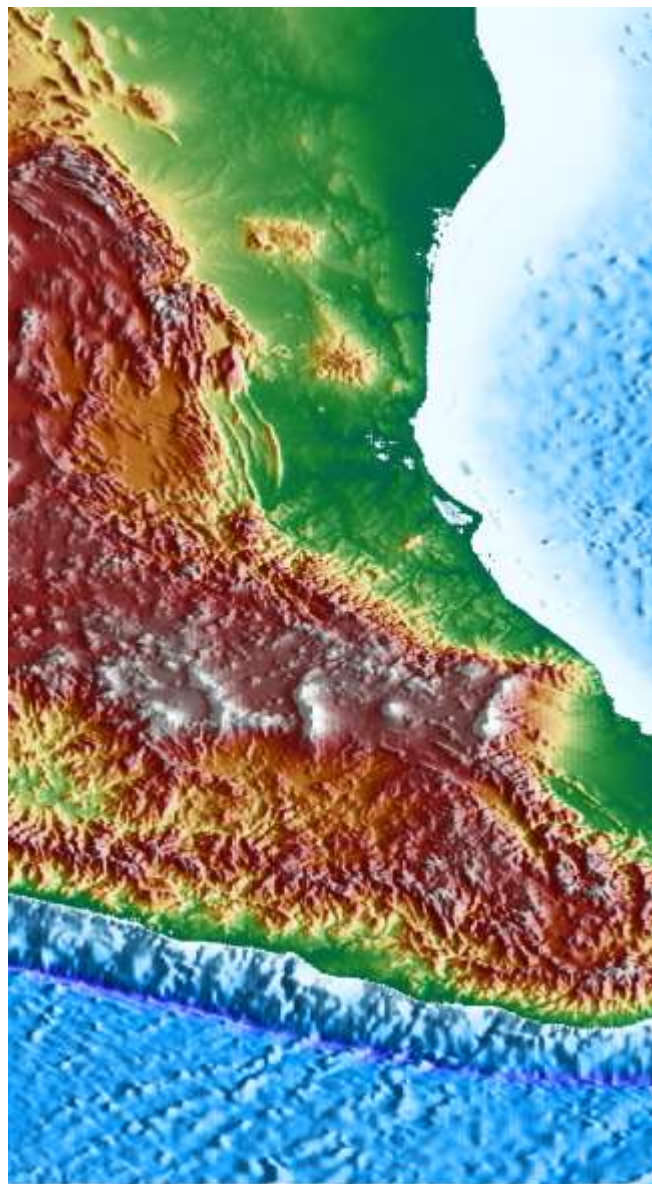
# SISMOLOGÍA



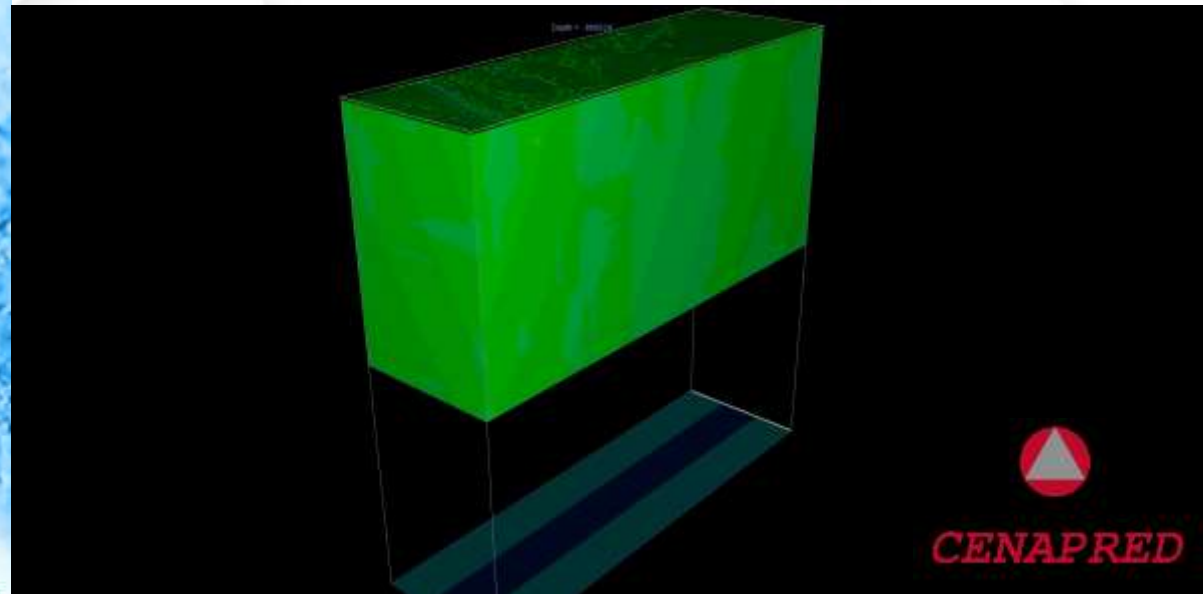
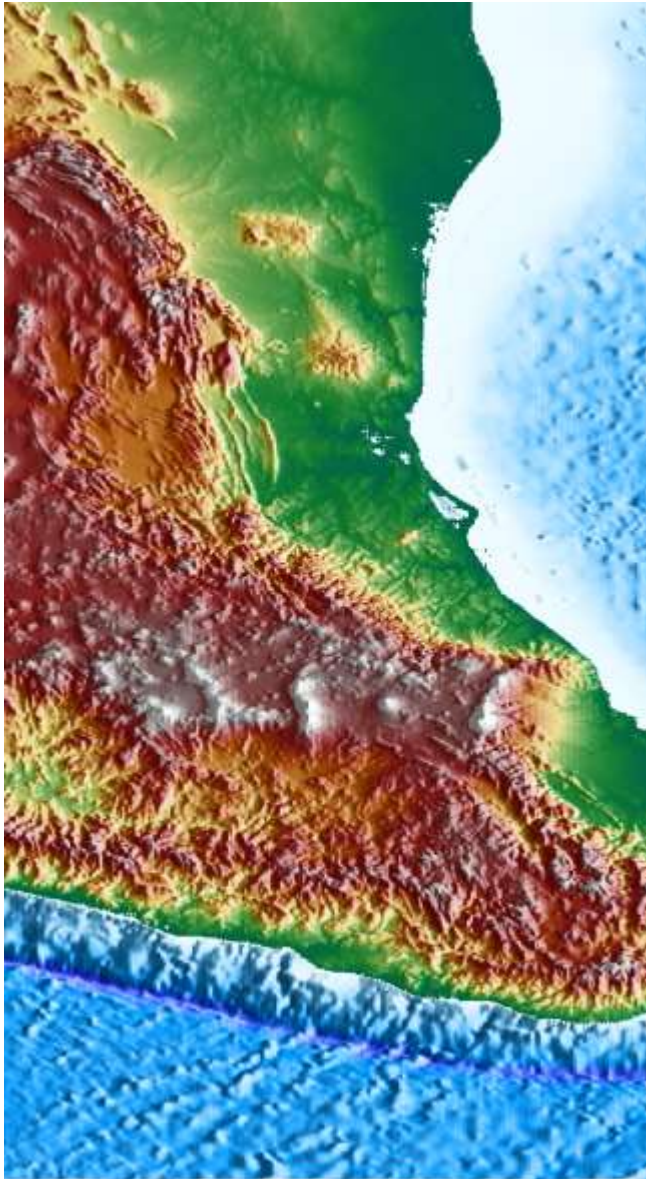
## Colaboraciones

- the Tectonics Observatory (TO) at Caltech,
- the Center for Embedded Network Sensors (CENS) at UCLA,
- the Institute of Geophysics at University National Autonomous of Mexico (IG/UNAM), and
- the Geoscience Center at UNAM

## Inversión Geofísica

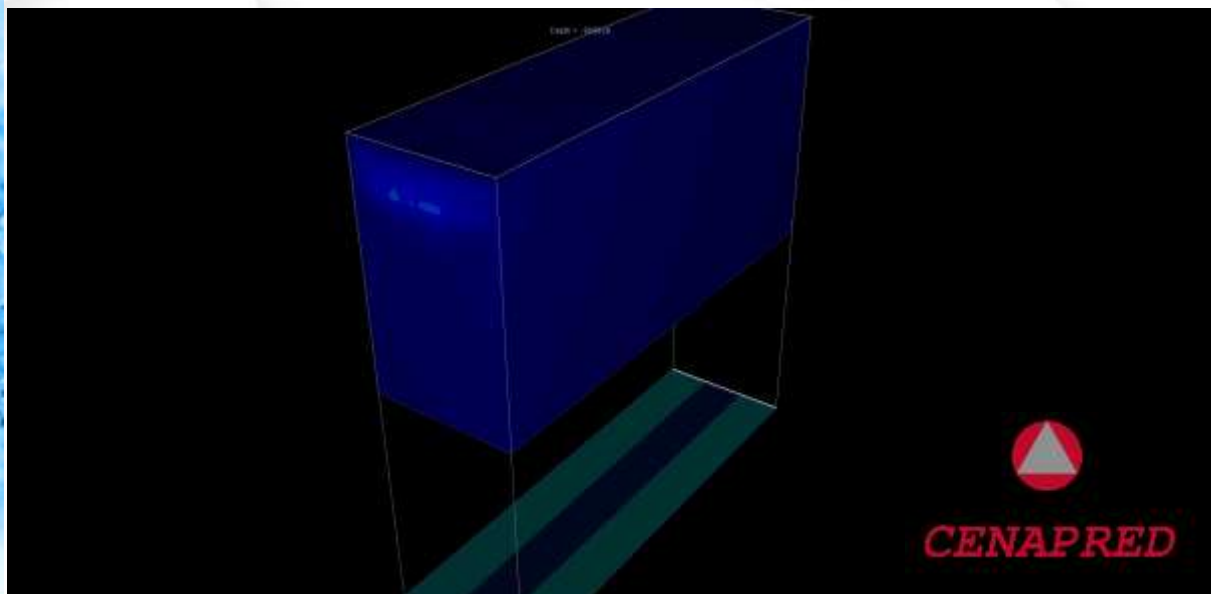
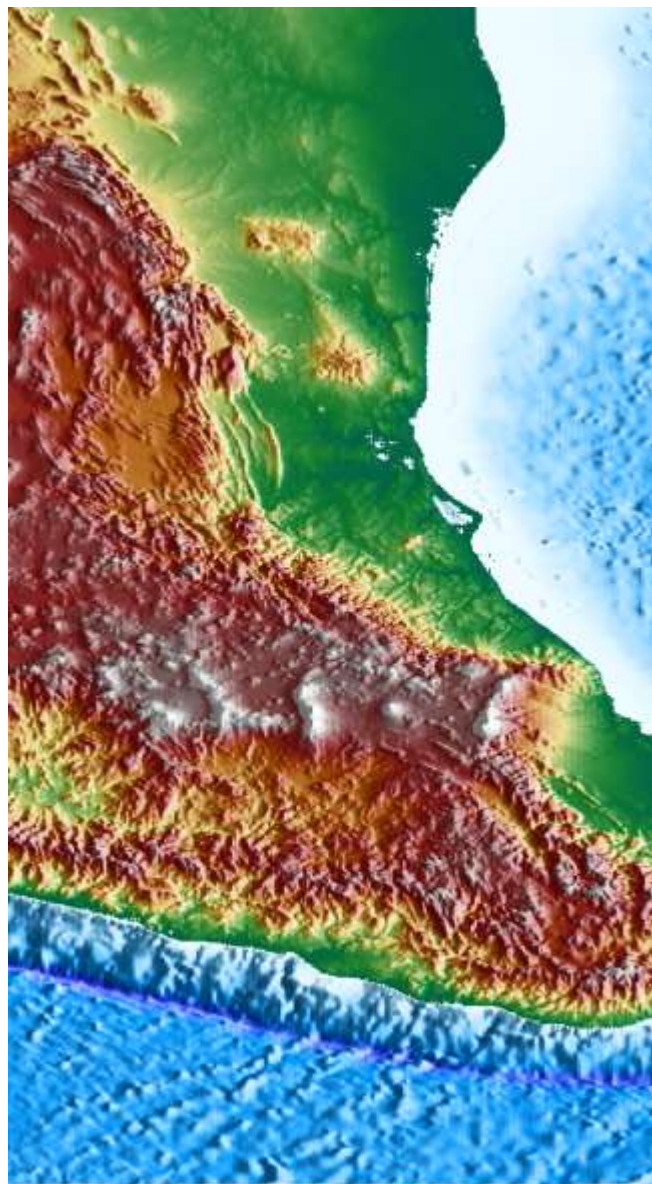


## Densidad de estructuras geológicas

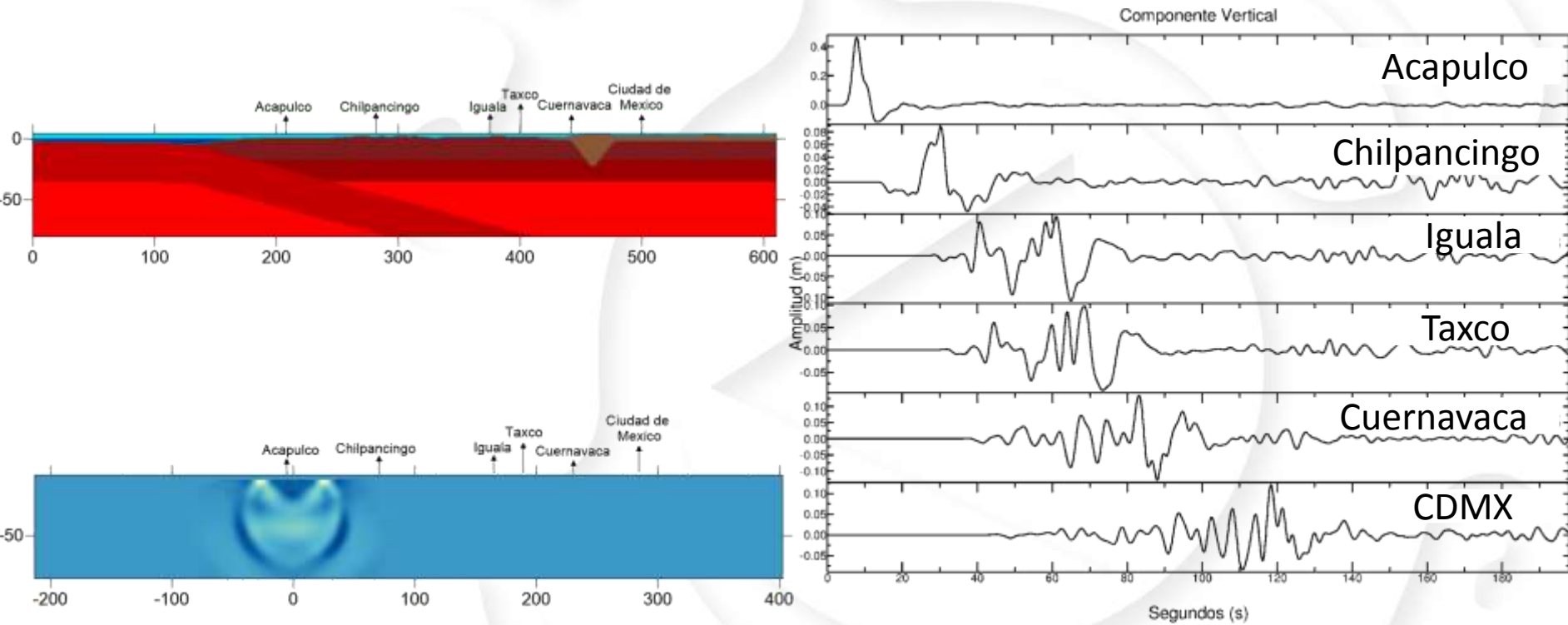


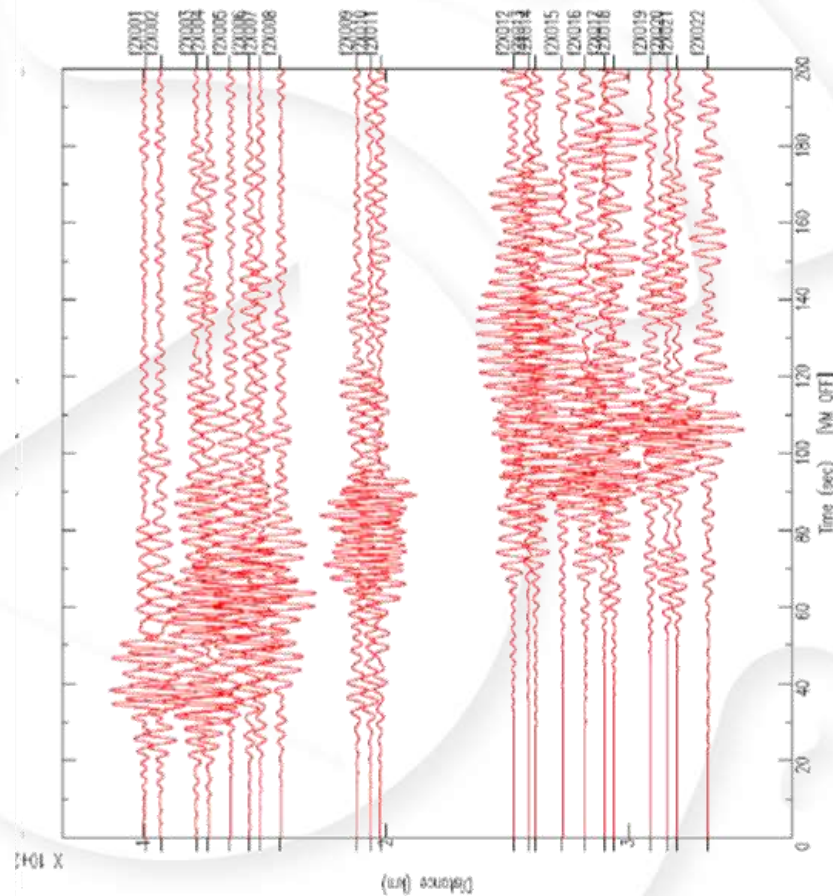
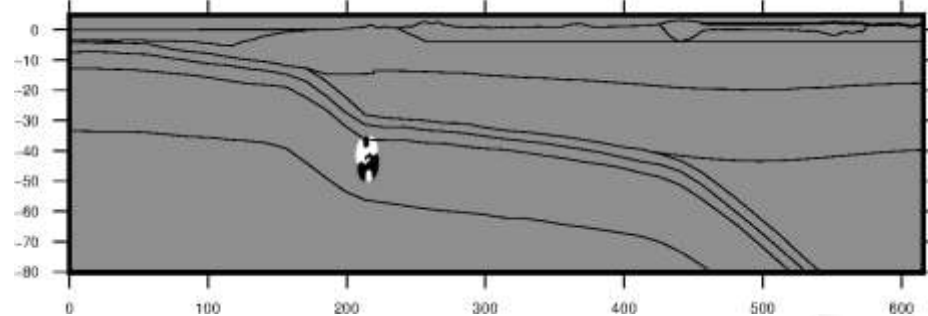
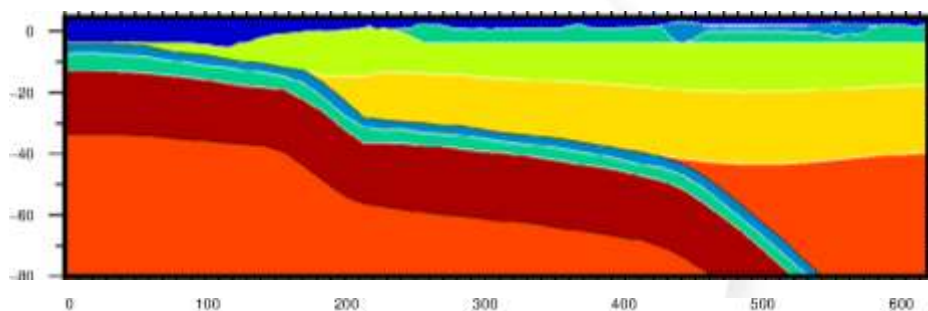


## Susceptibilidad magnética de estructuras geológicas

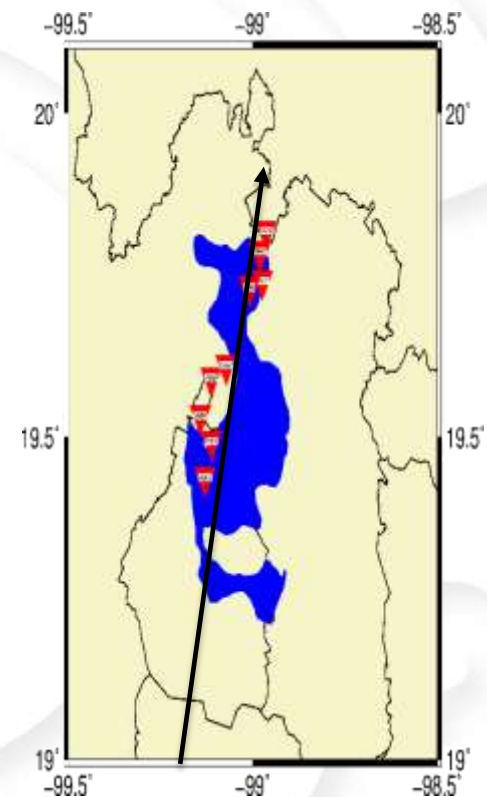
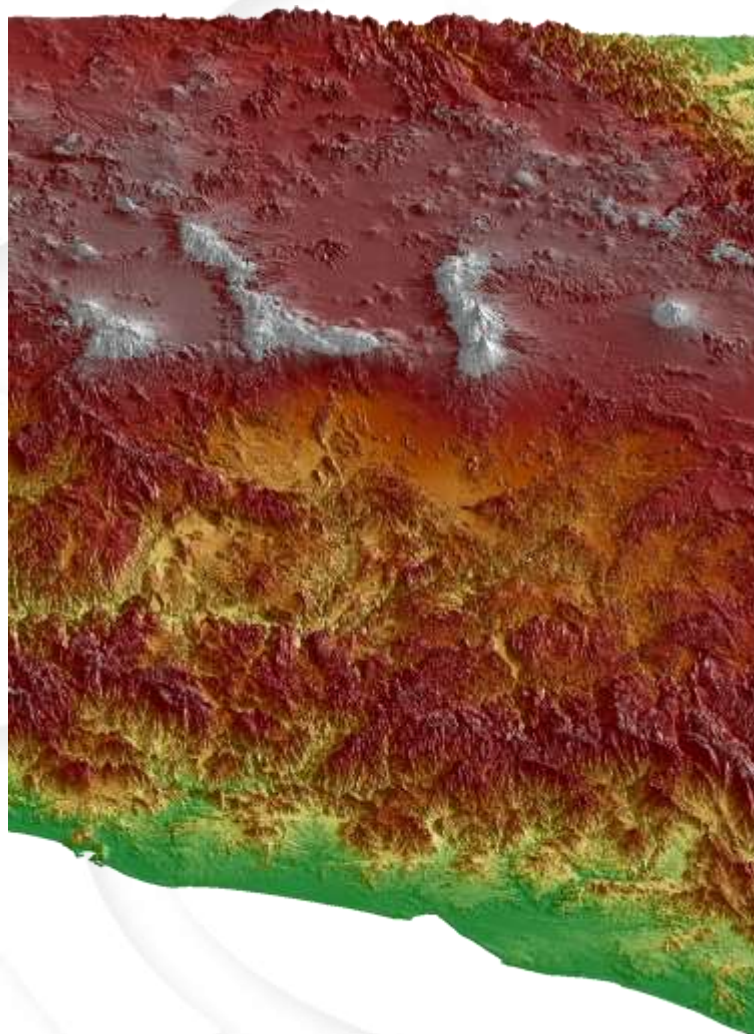


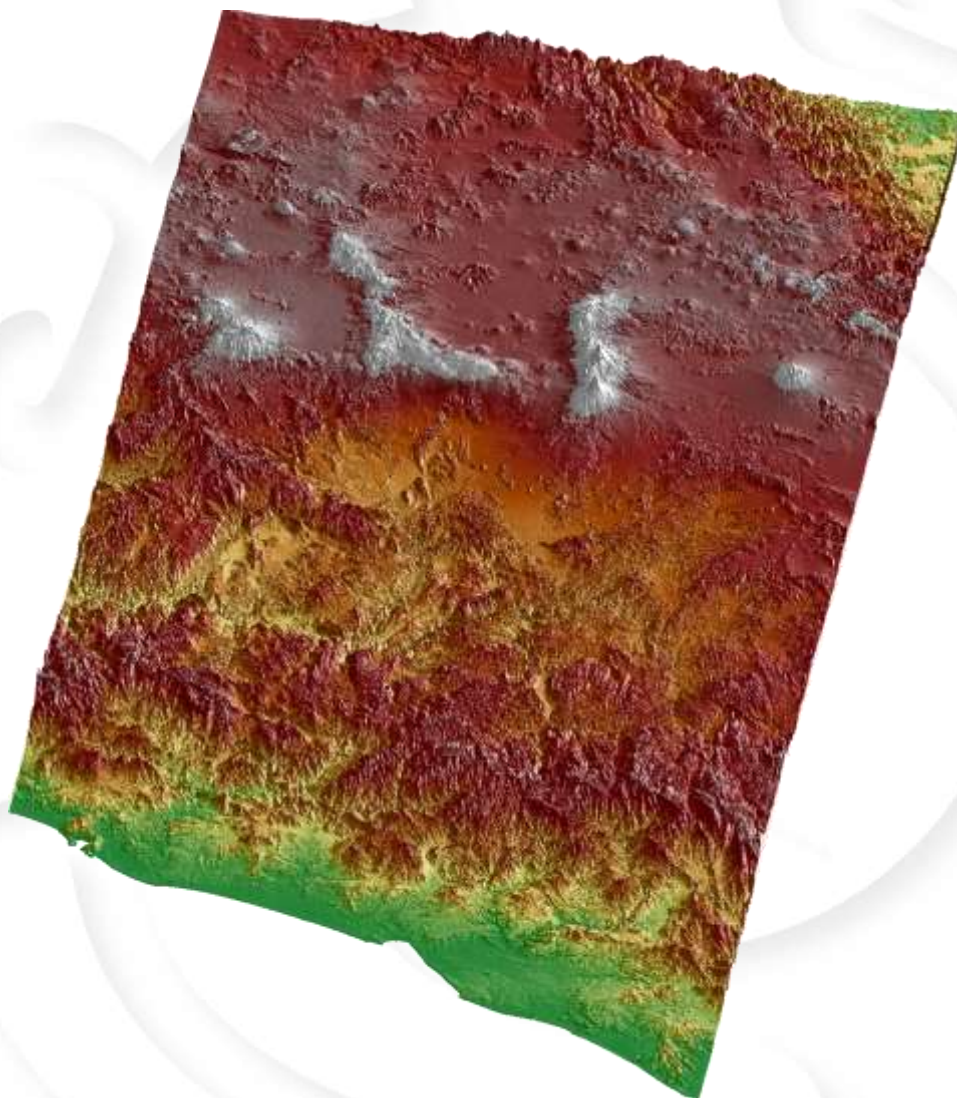
## Modelo Brecha sísmica de Guerrero

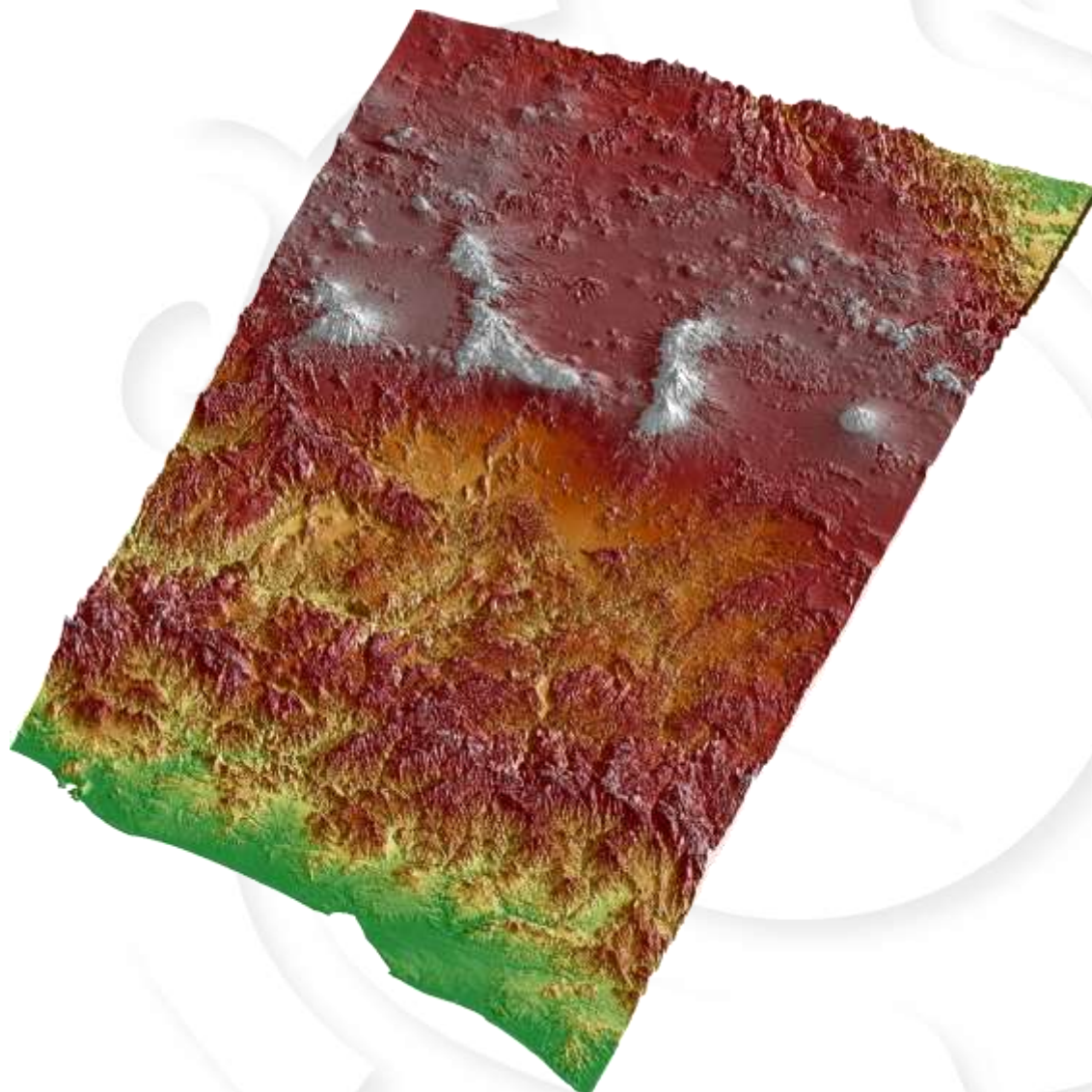


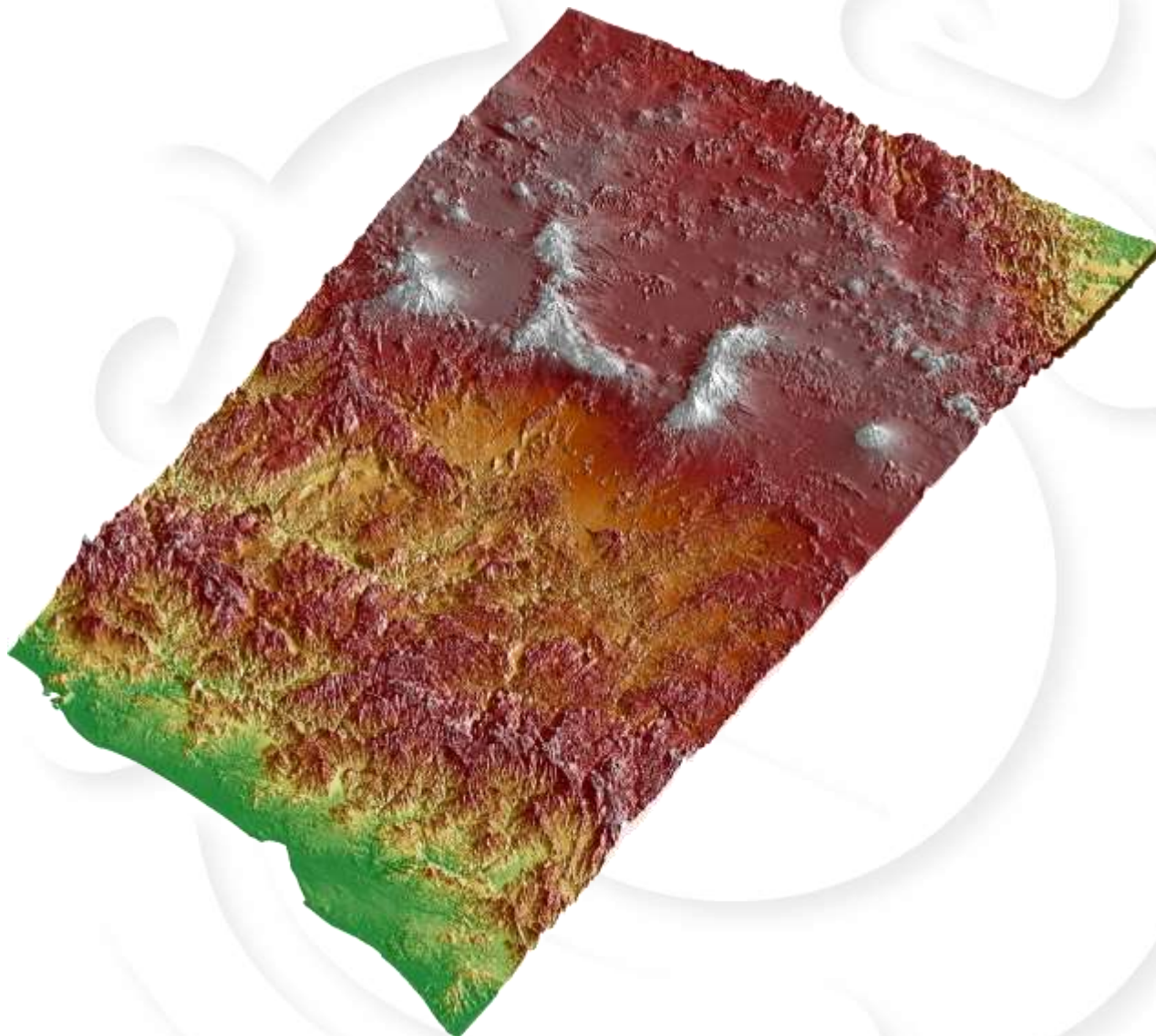


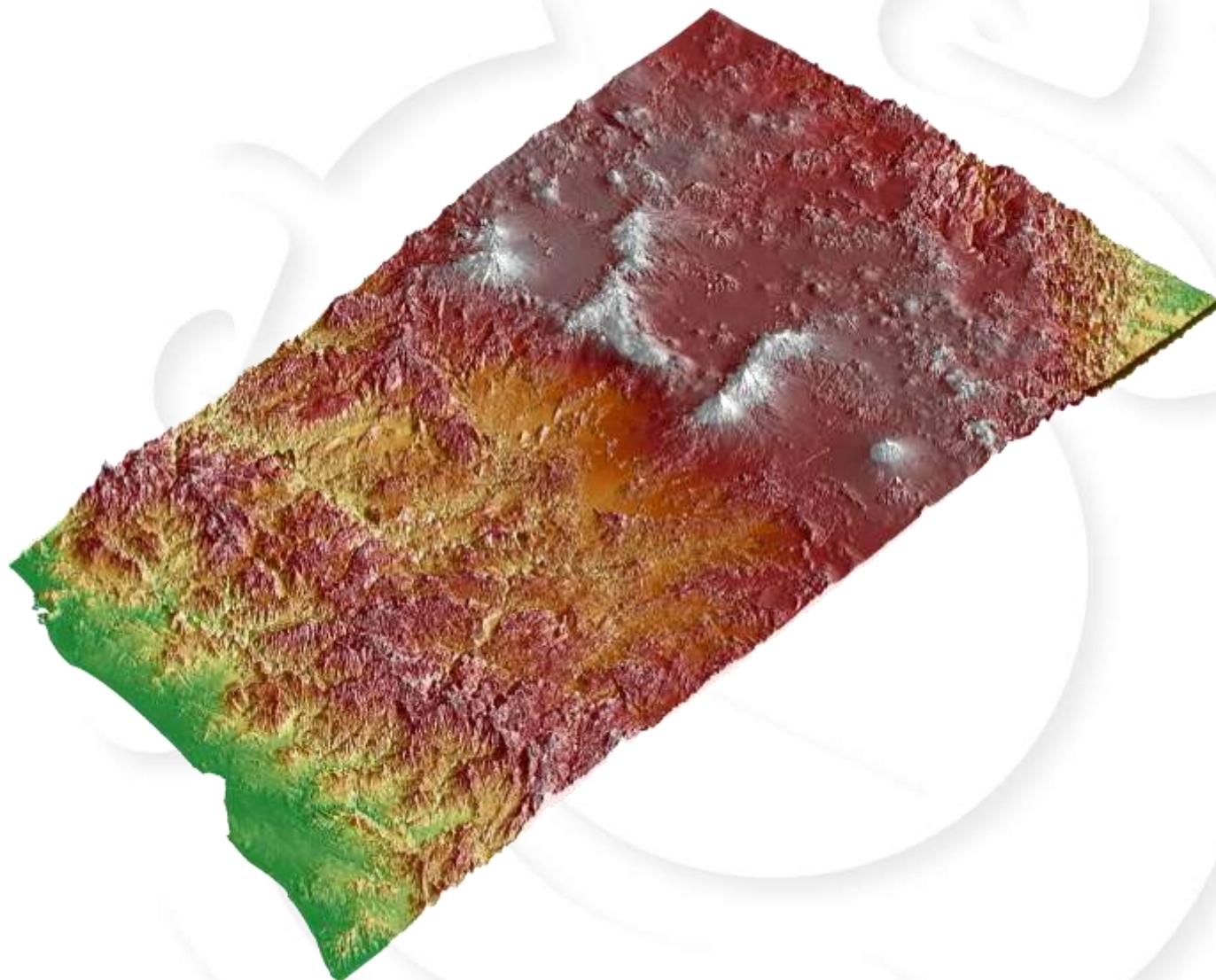
Fuente: CENAPRED, IPN, MASE, IISEE-BRI



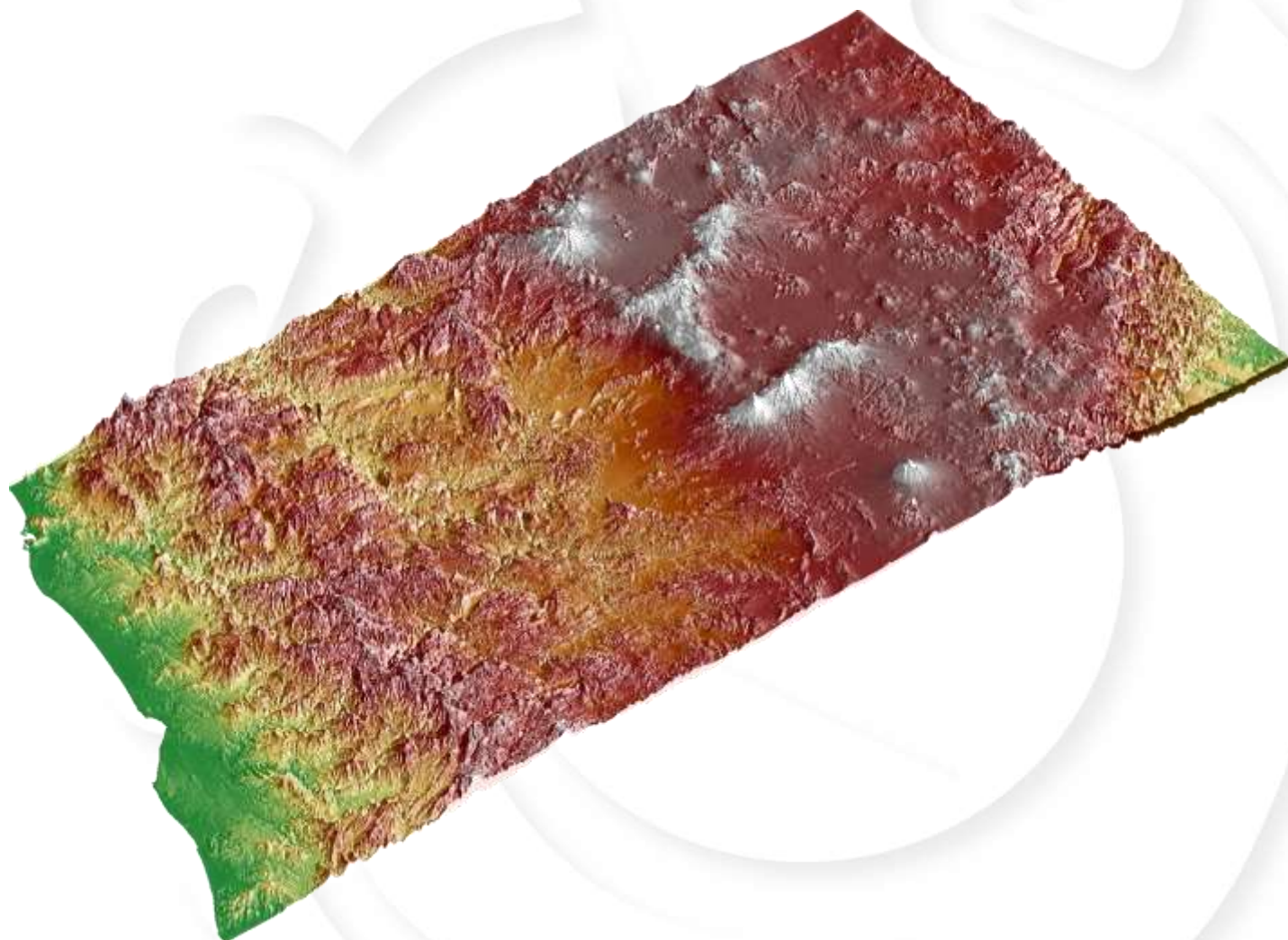


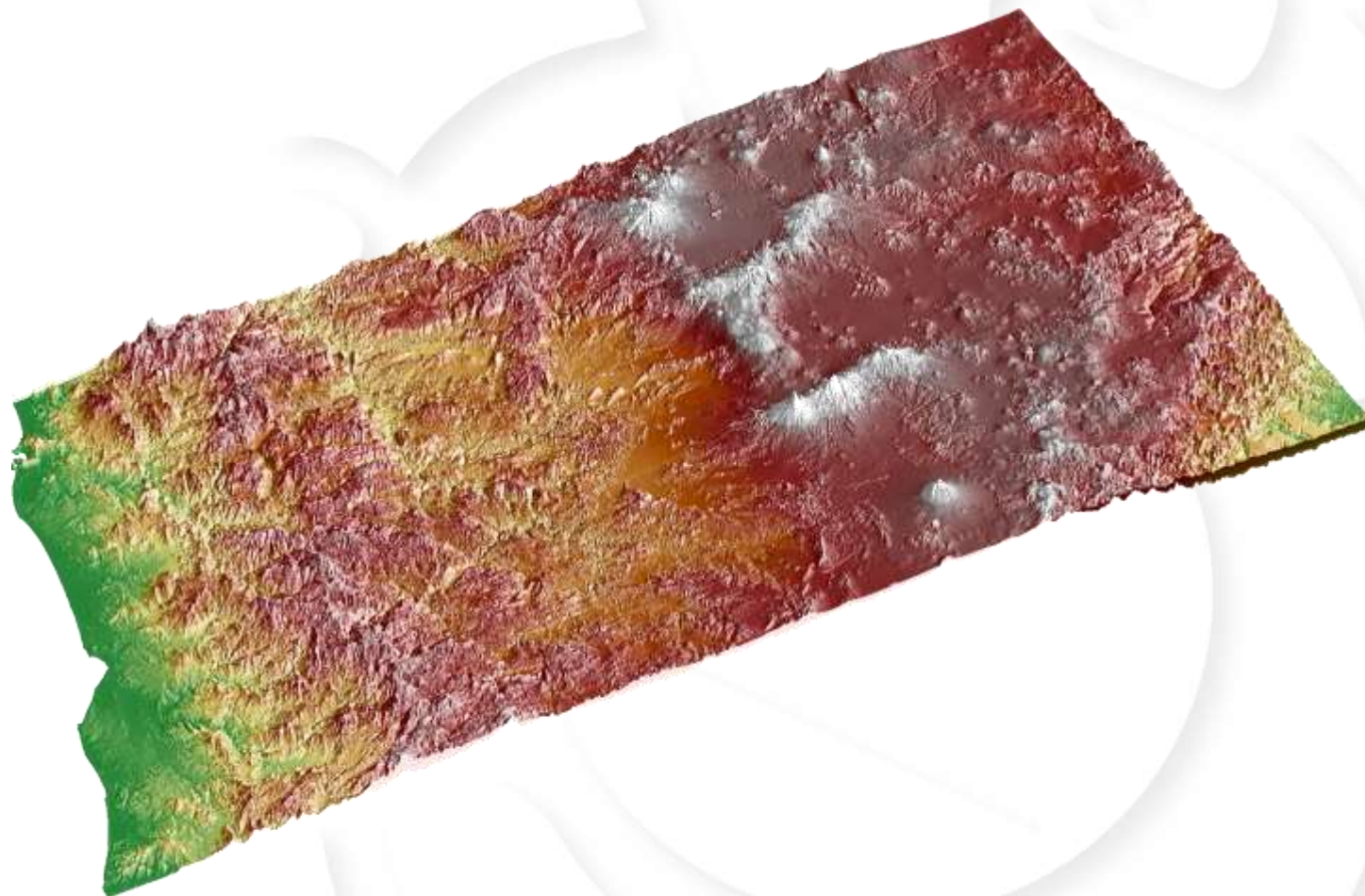




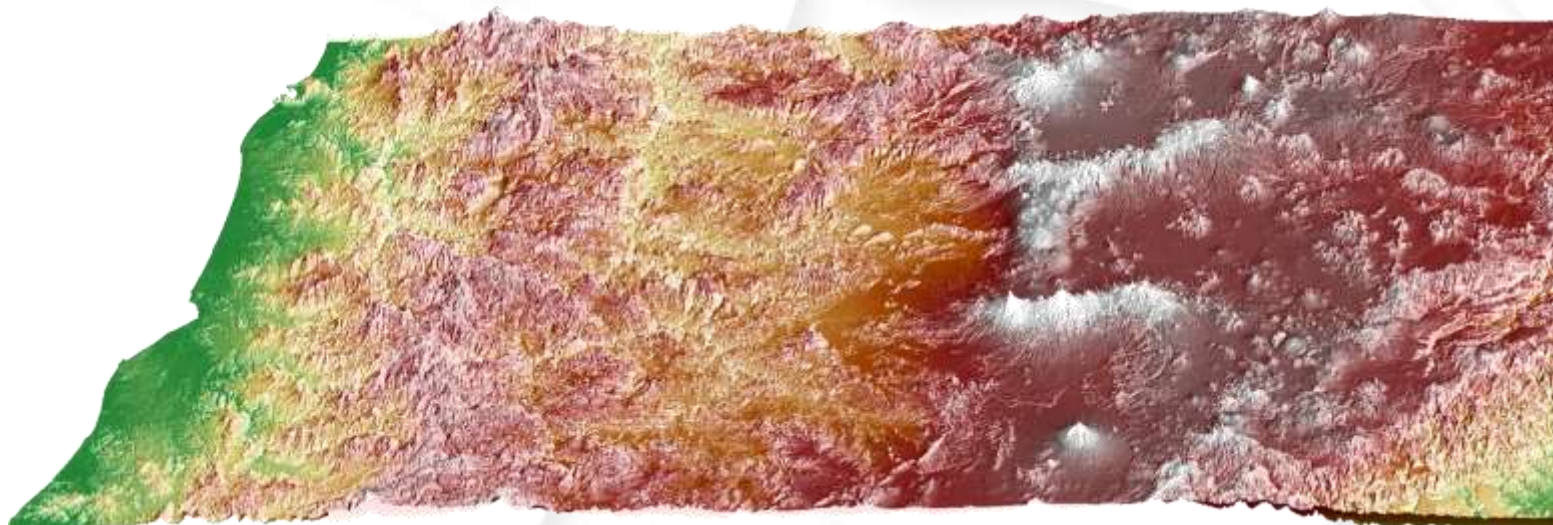


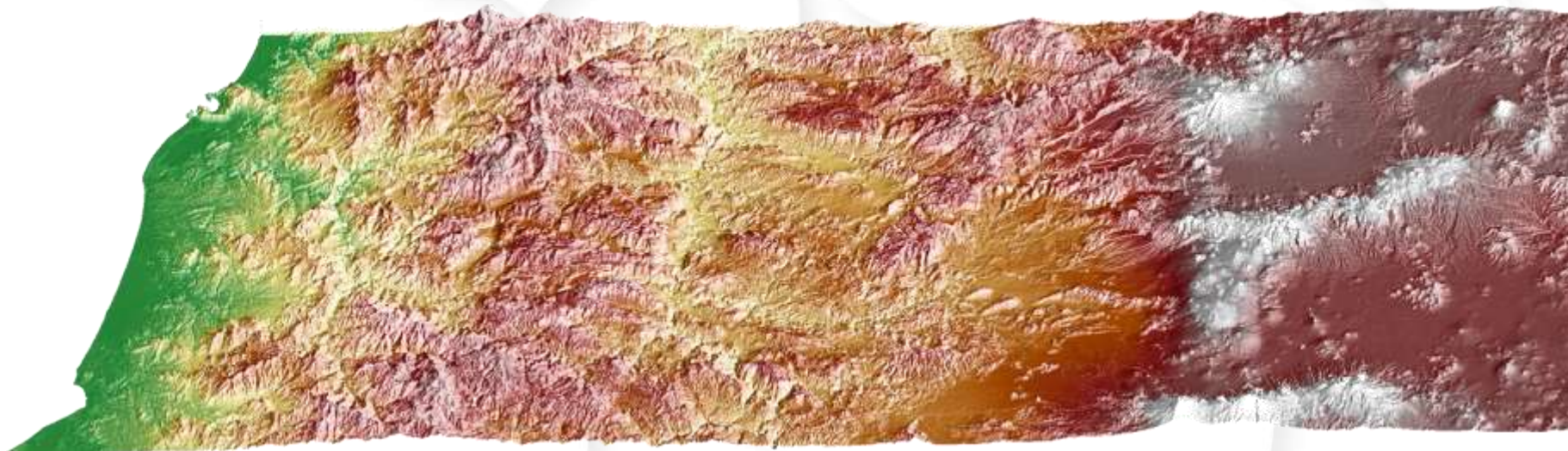












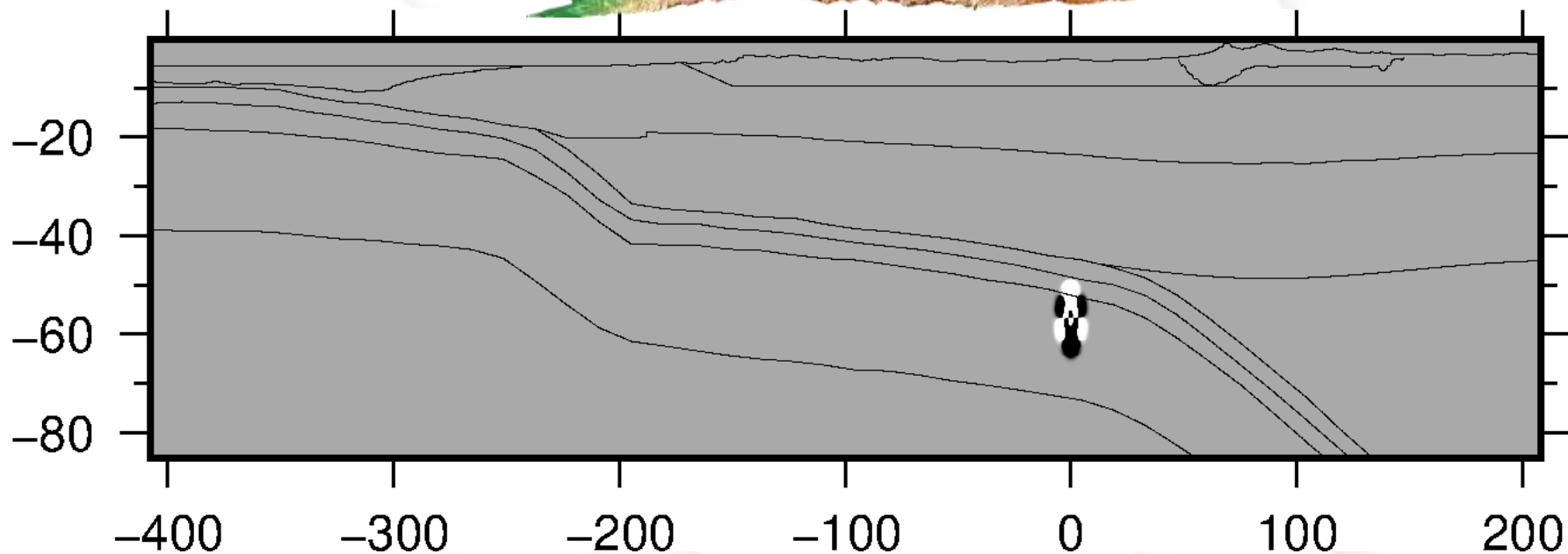


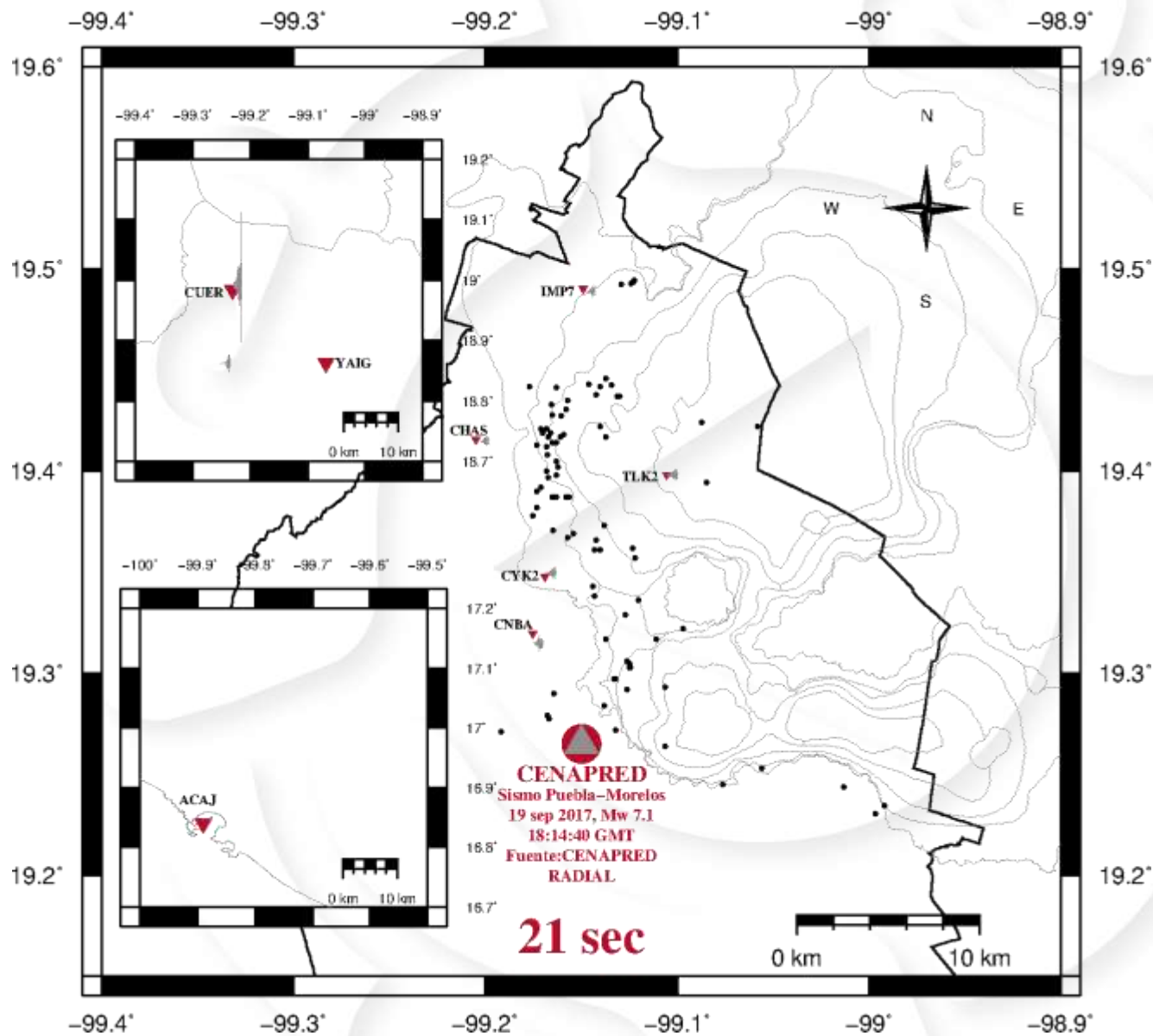


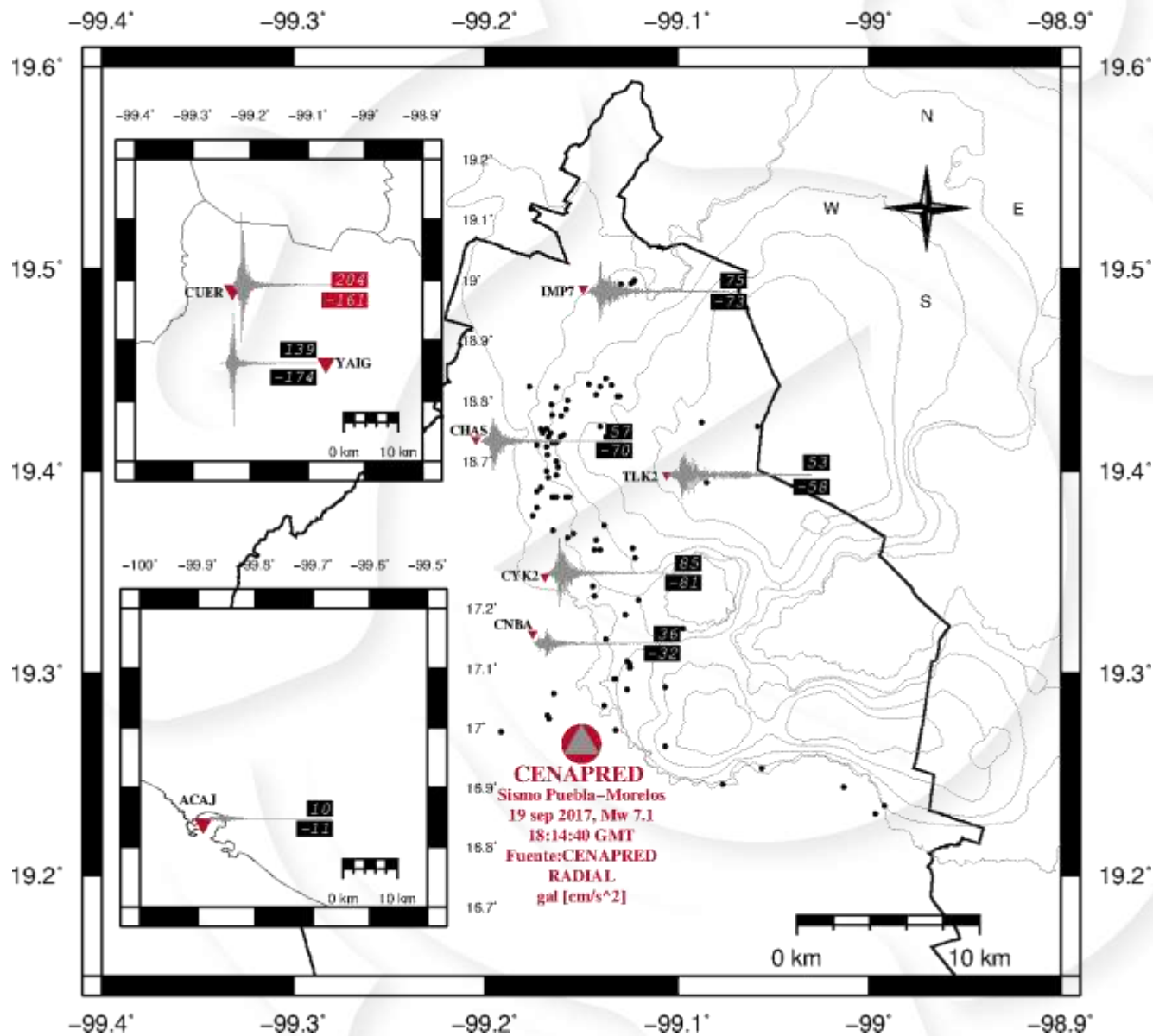


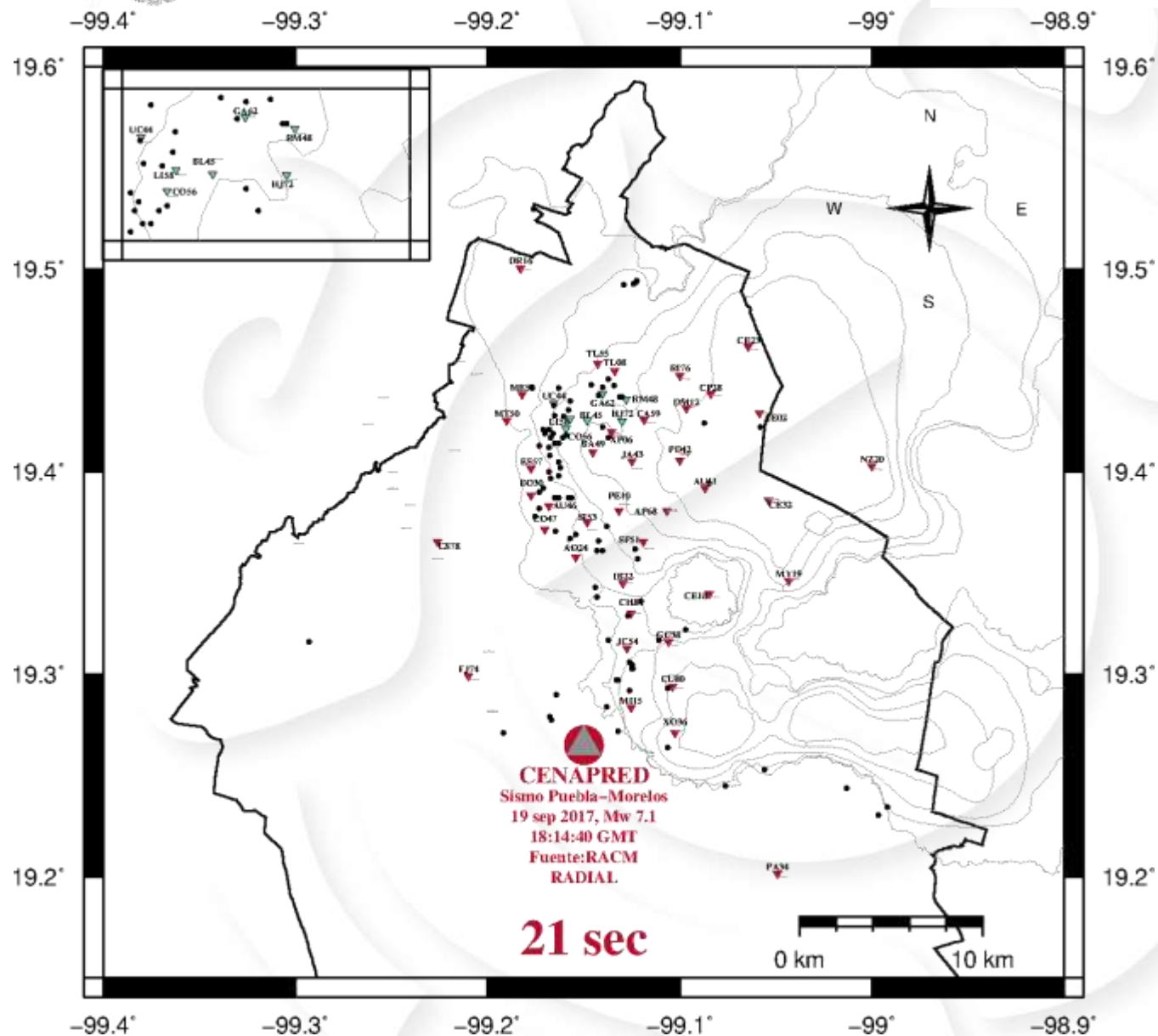




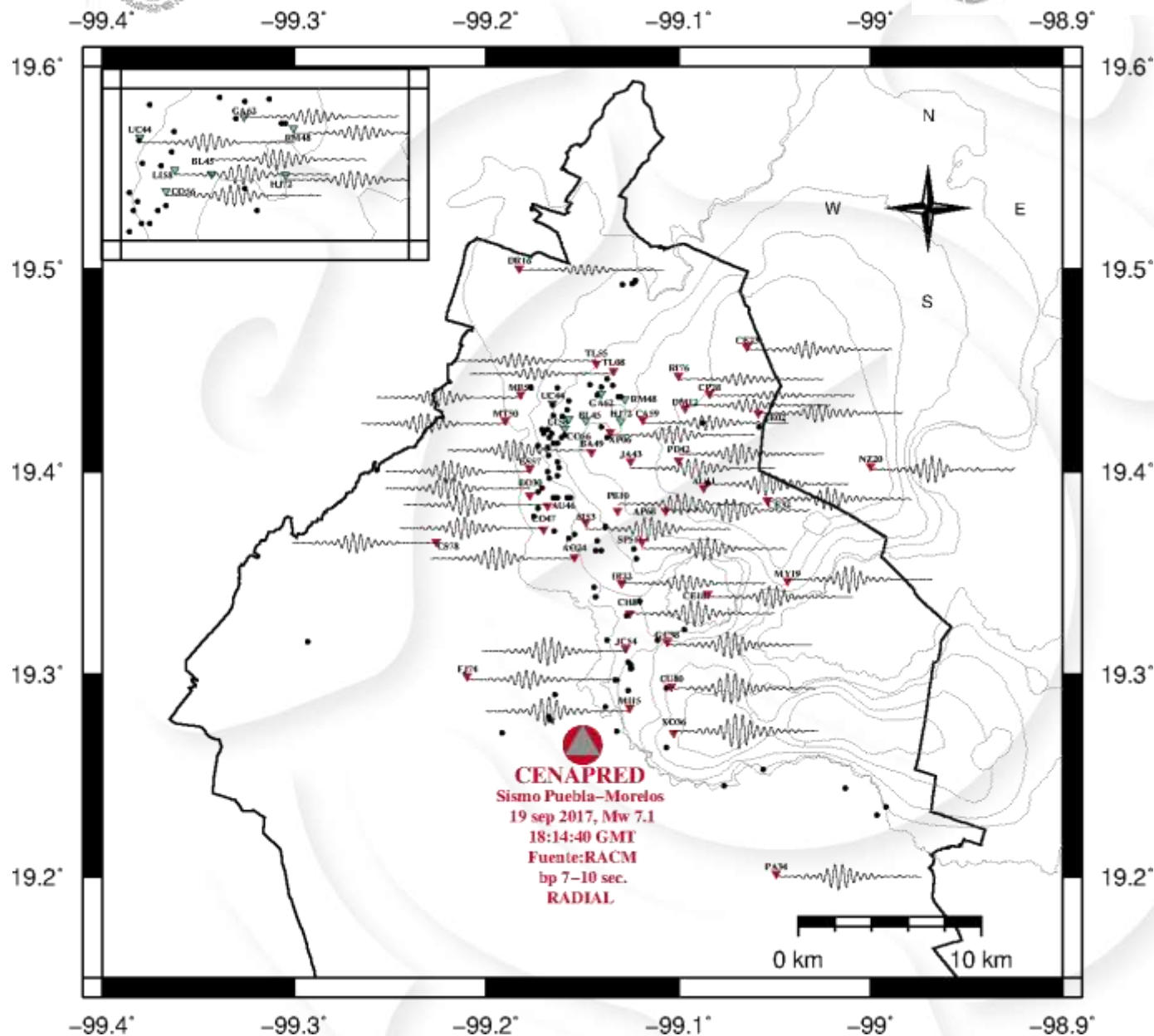


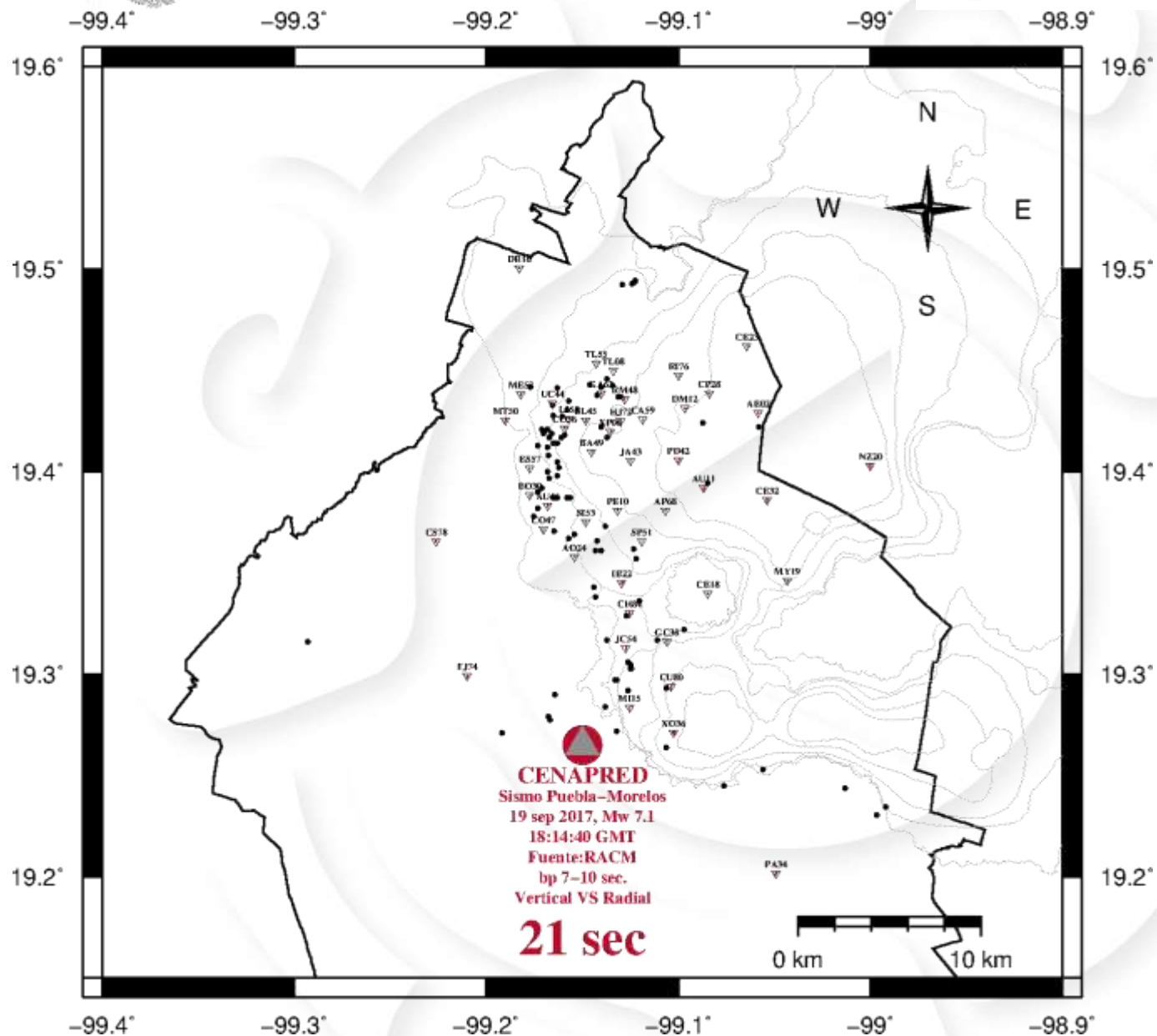




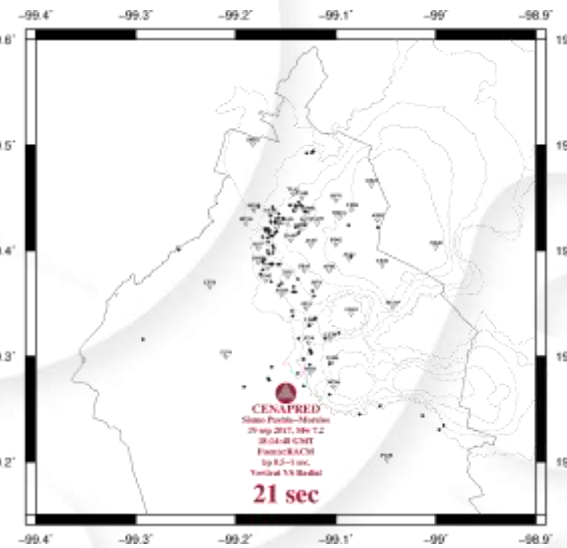
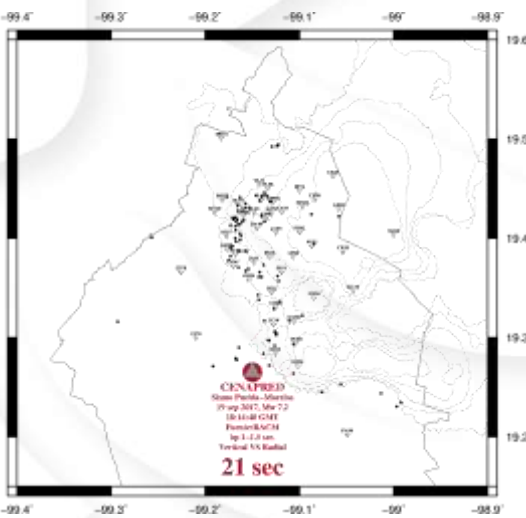
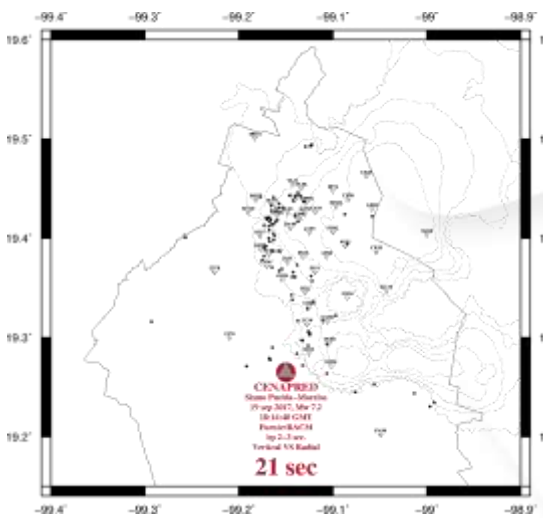
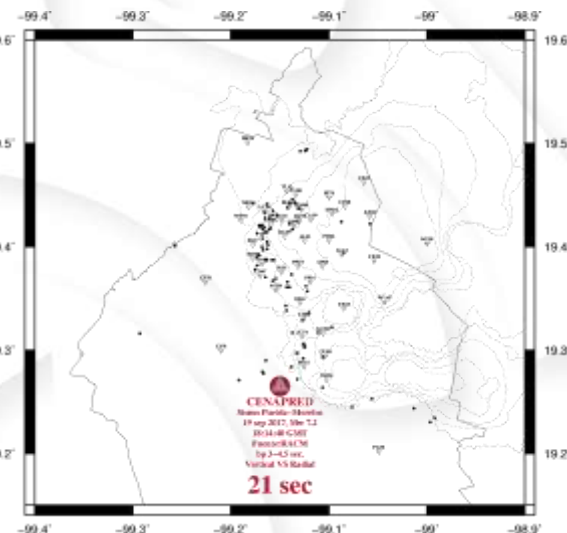
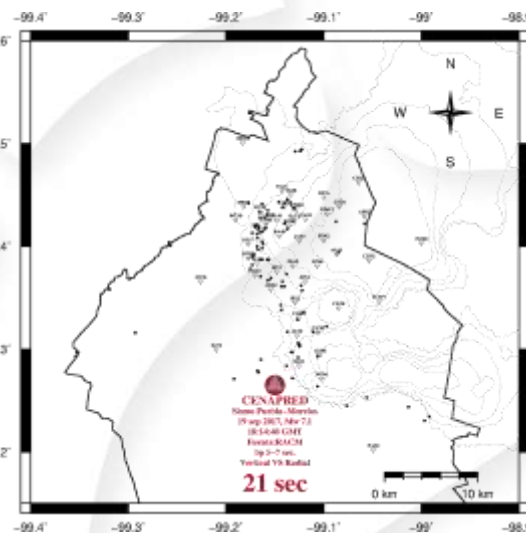
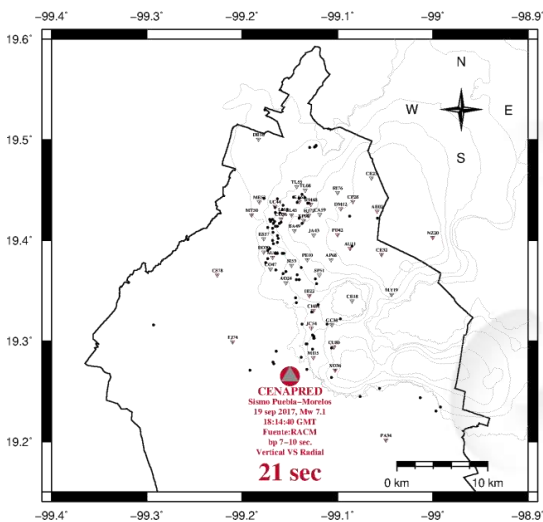






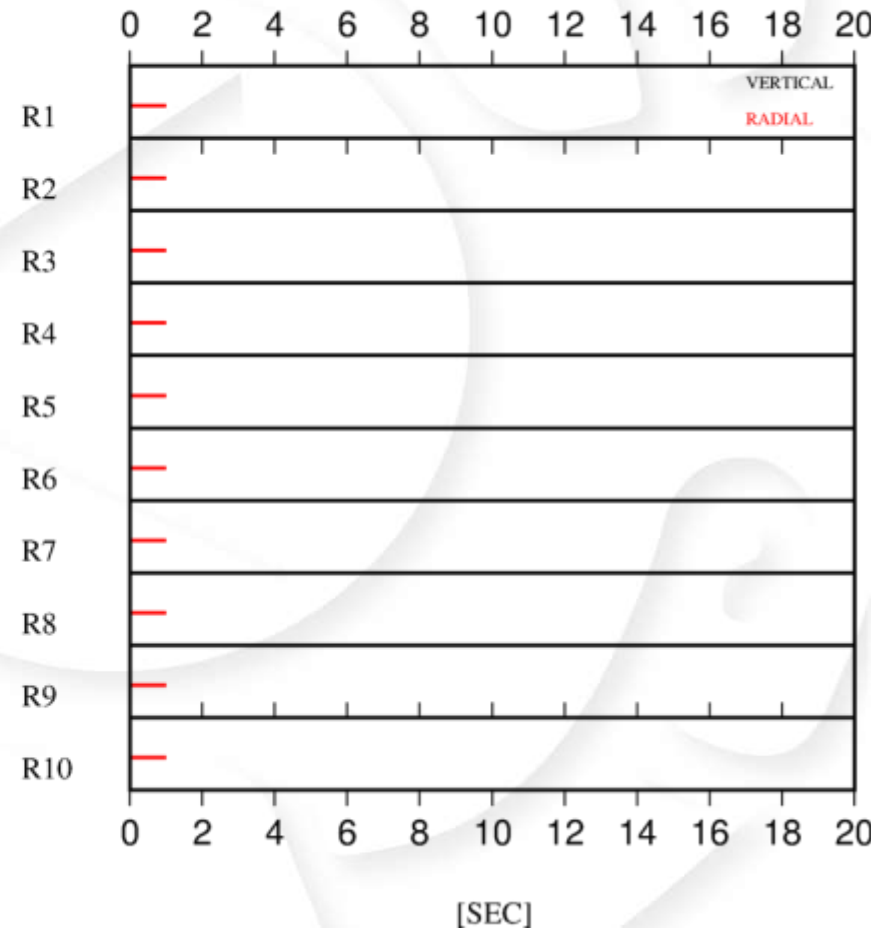
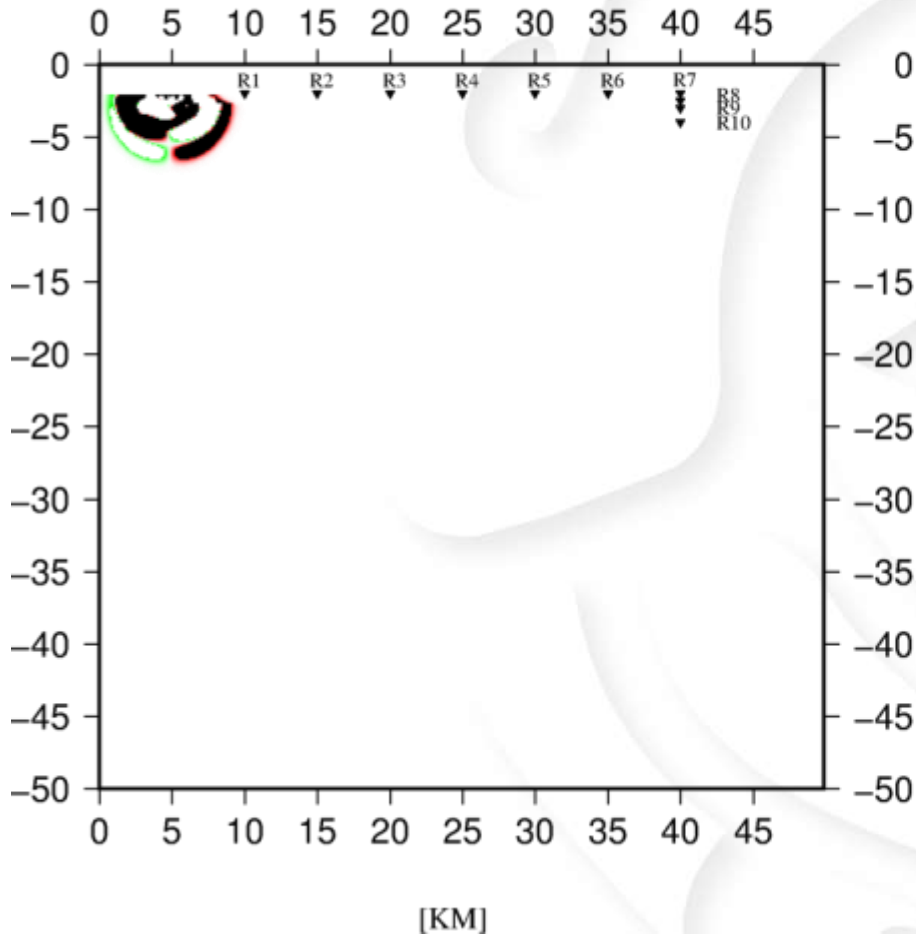




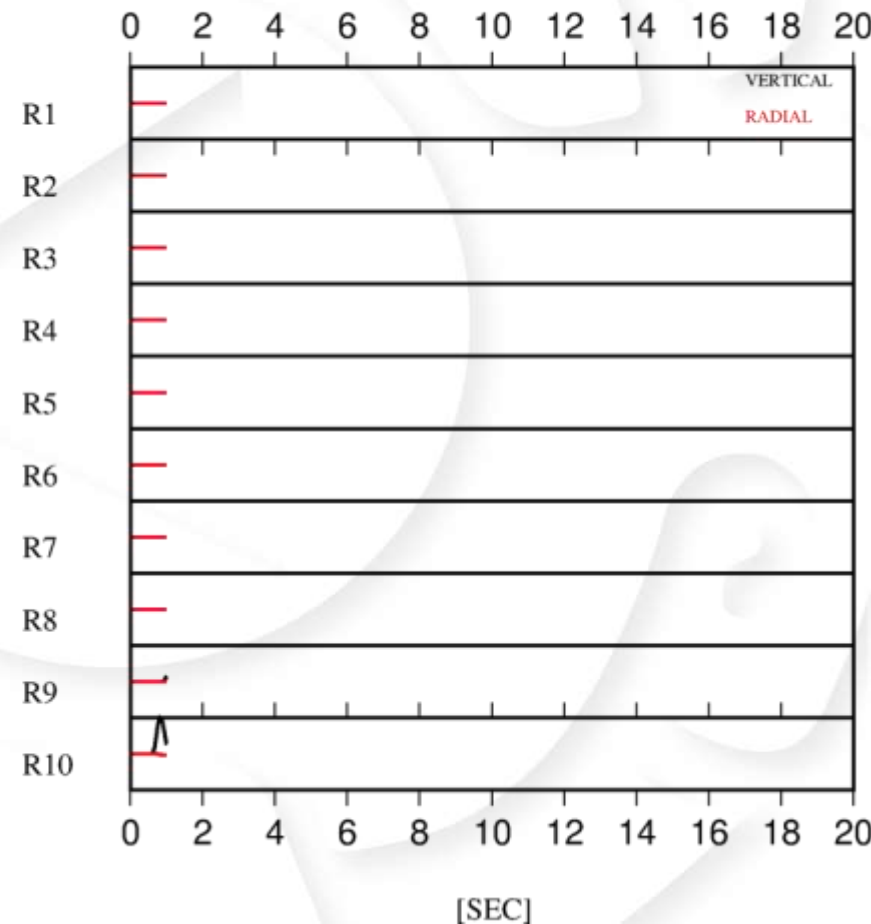
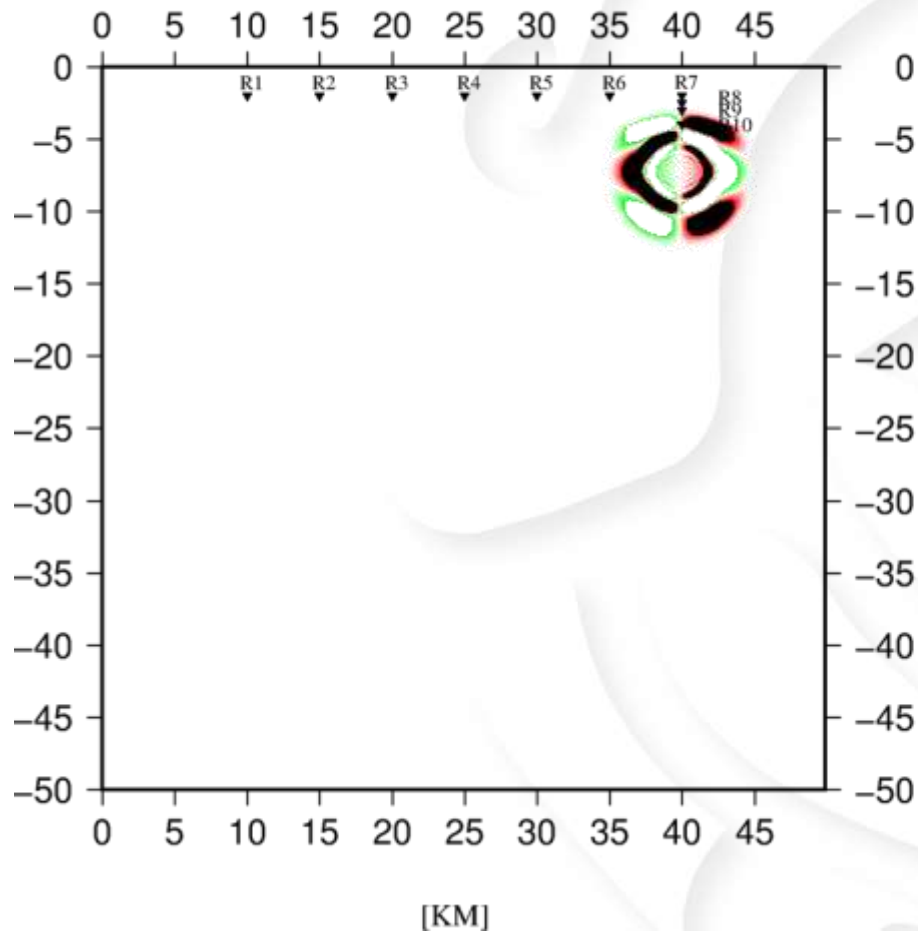




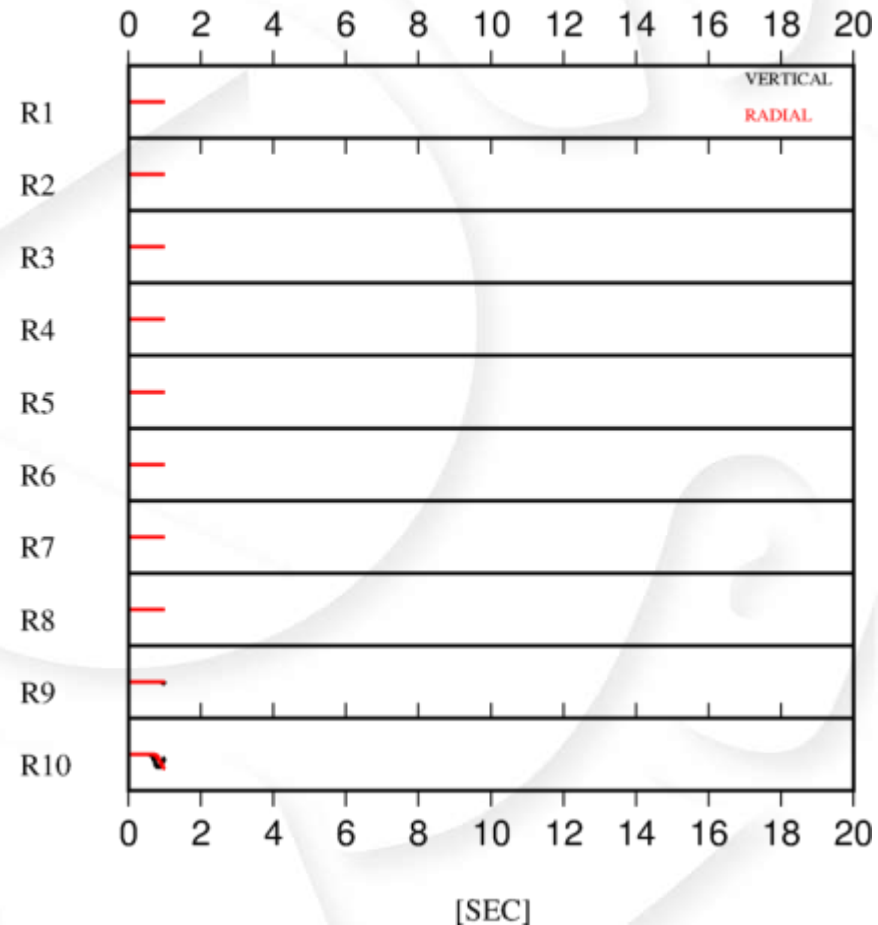
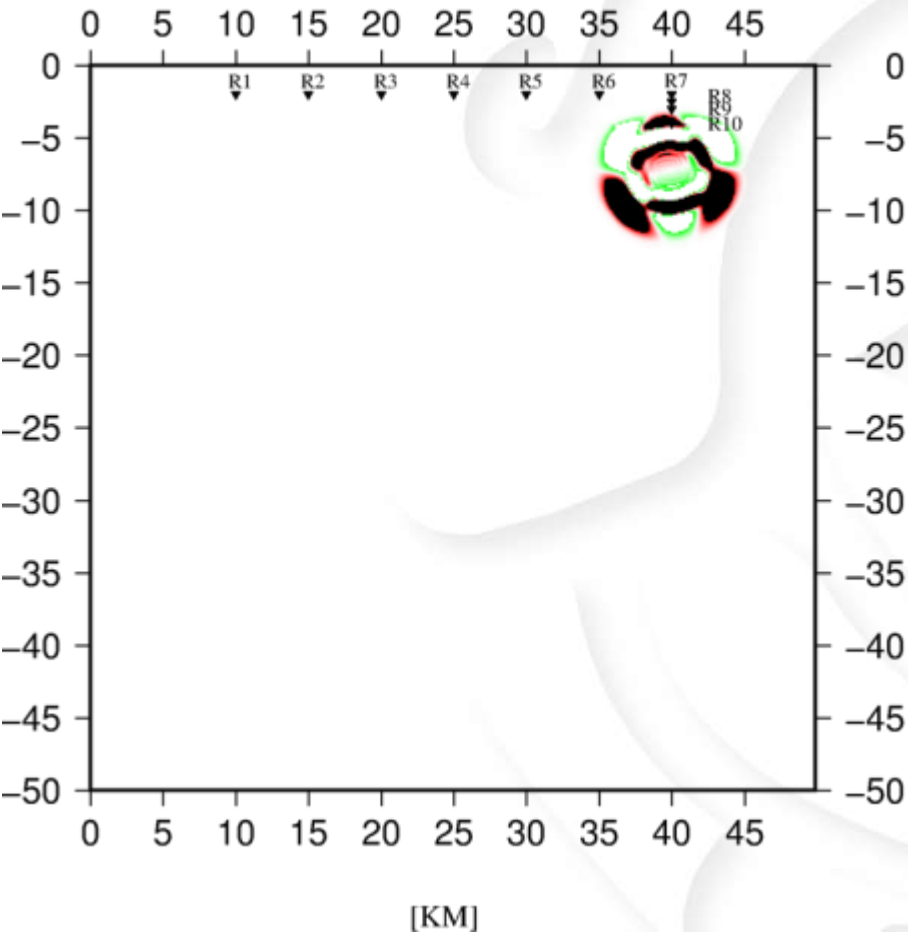
## Efectos de Cuña

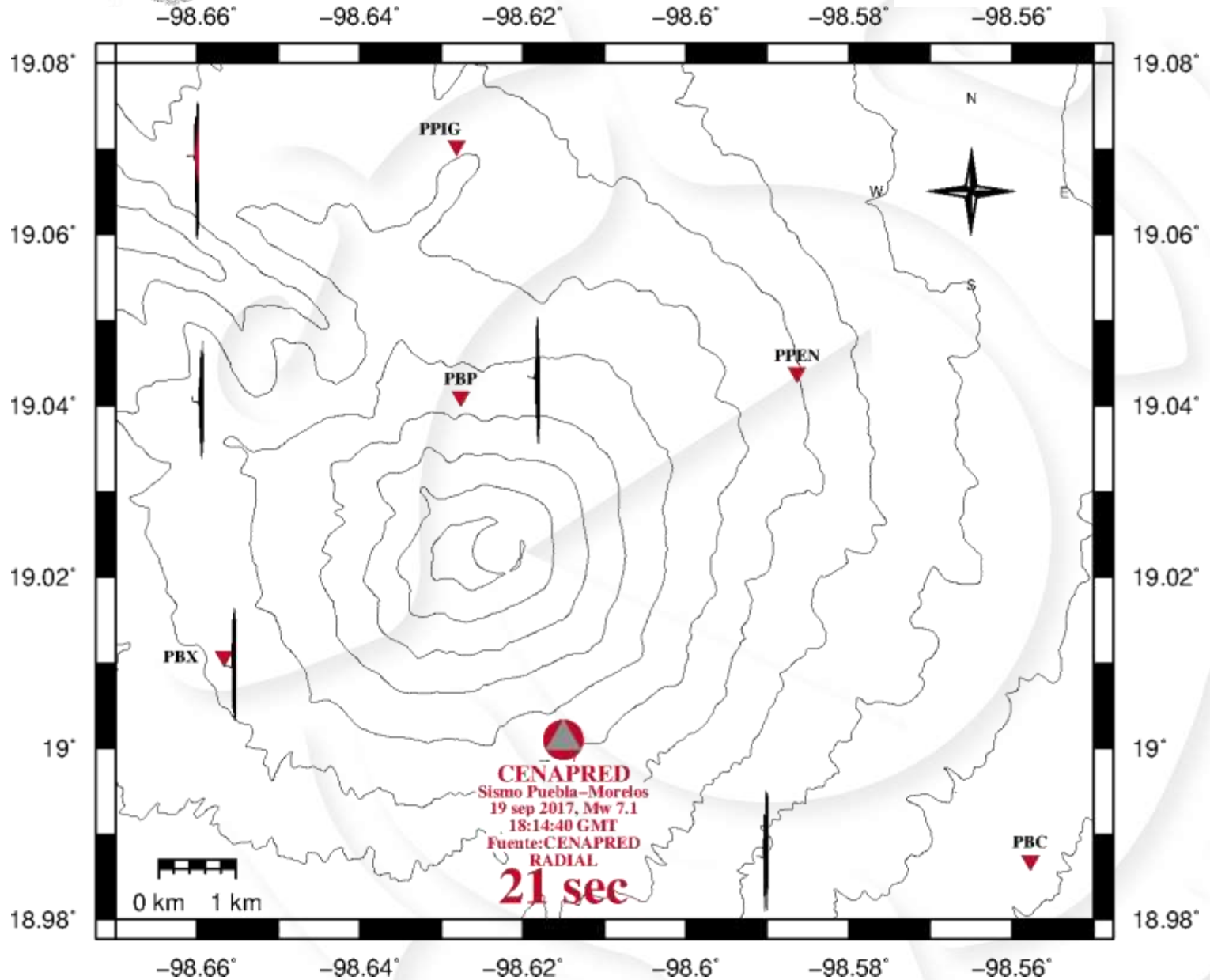


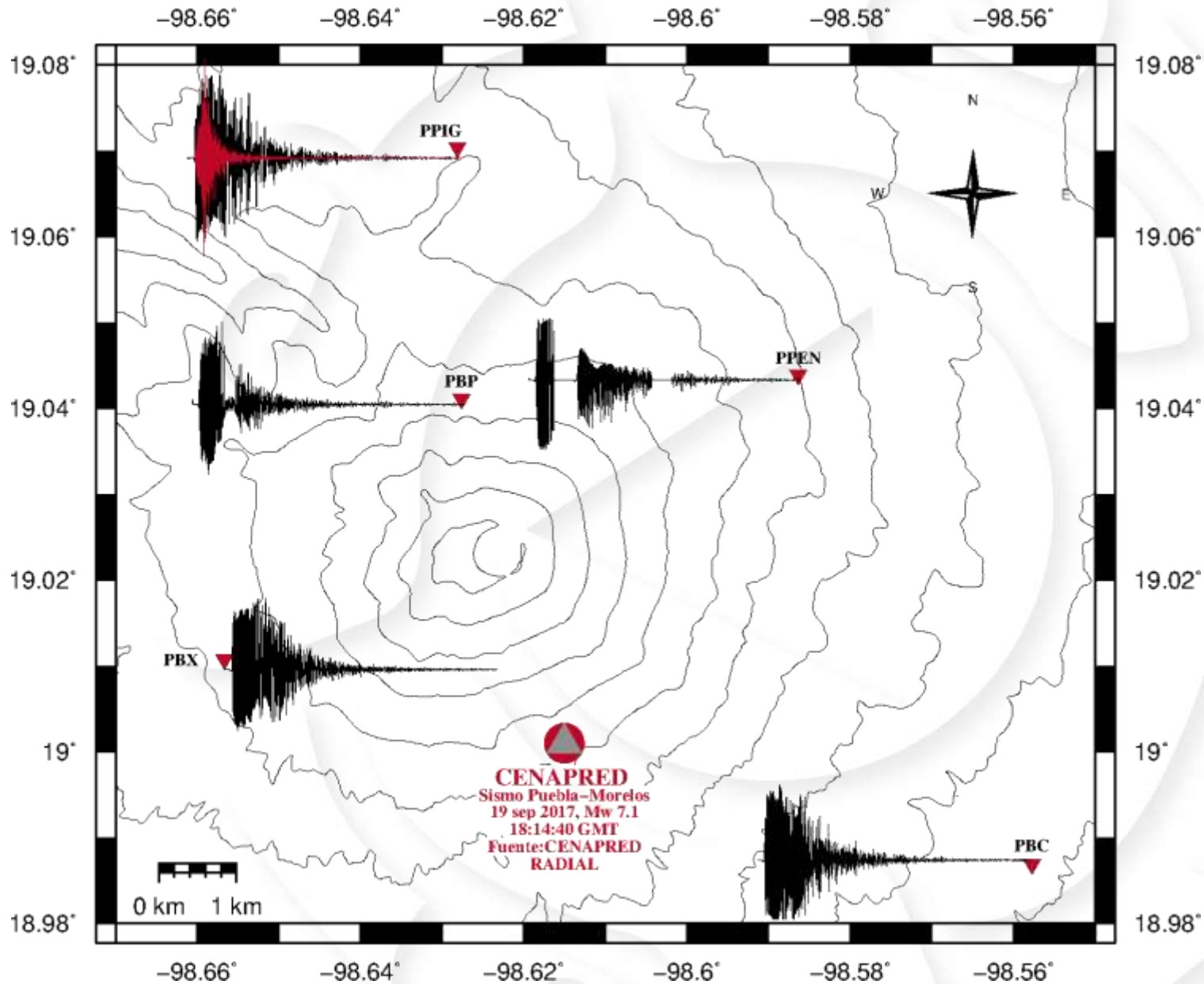
## Mecanismo de la fuente



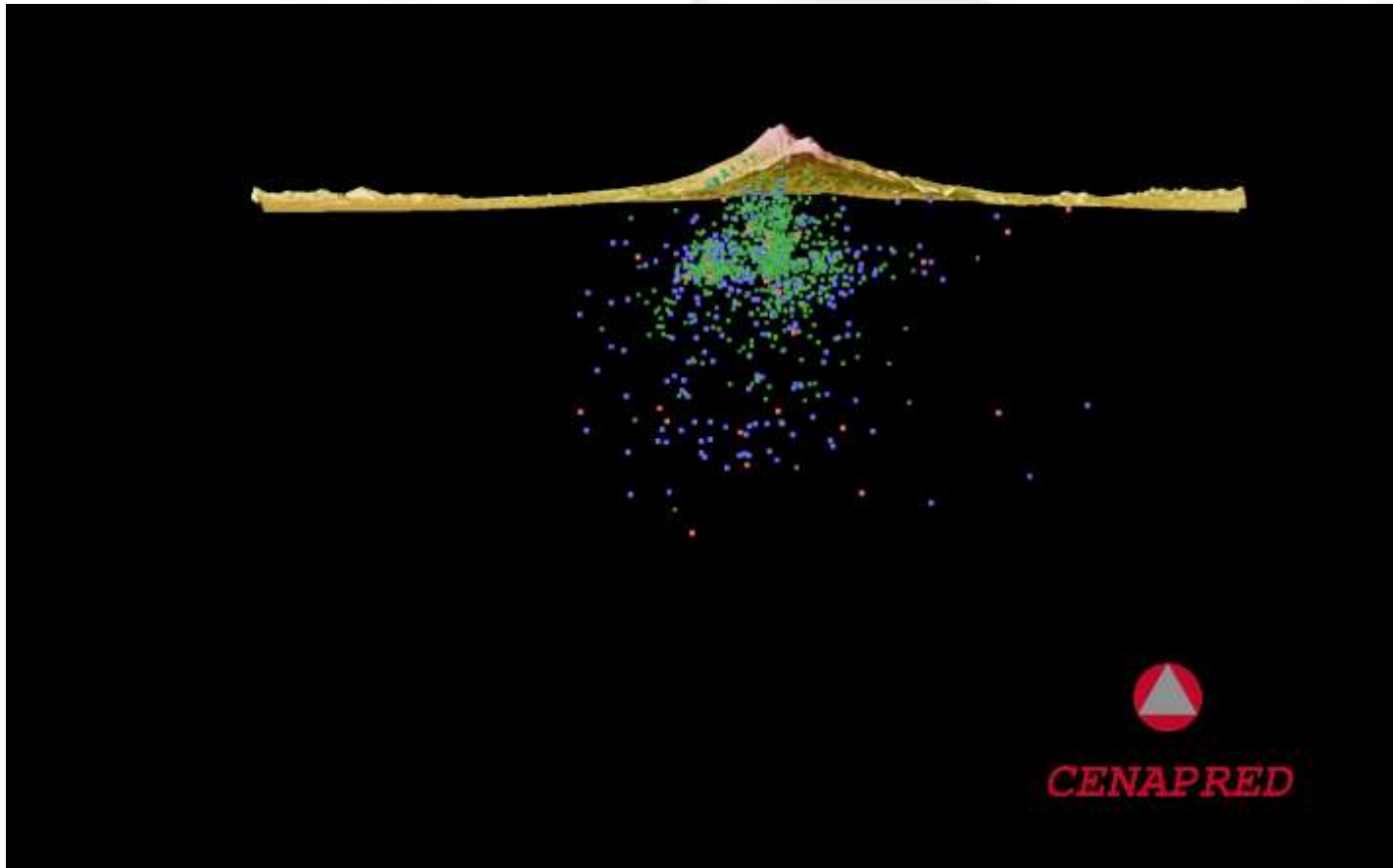
### Mecanismo de la fuente



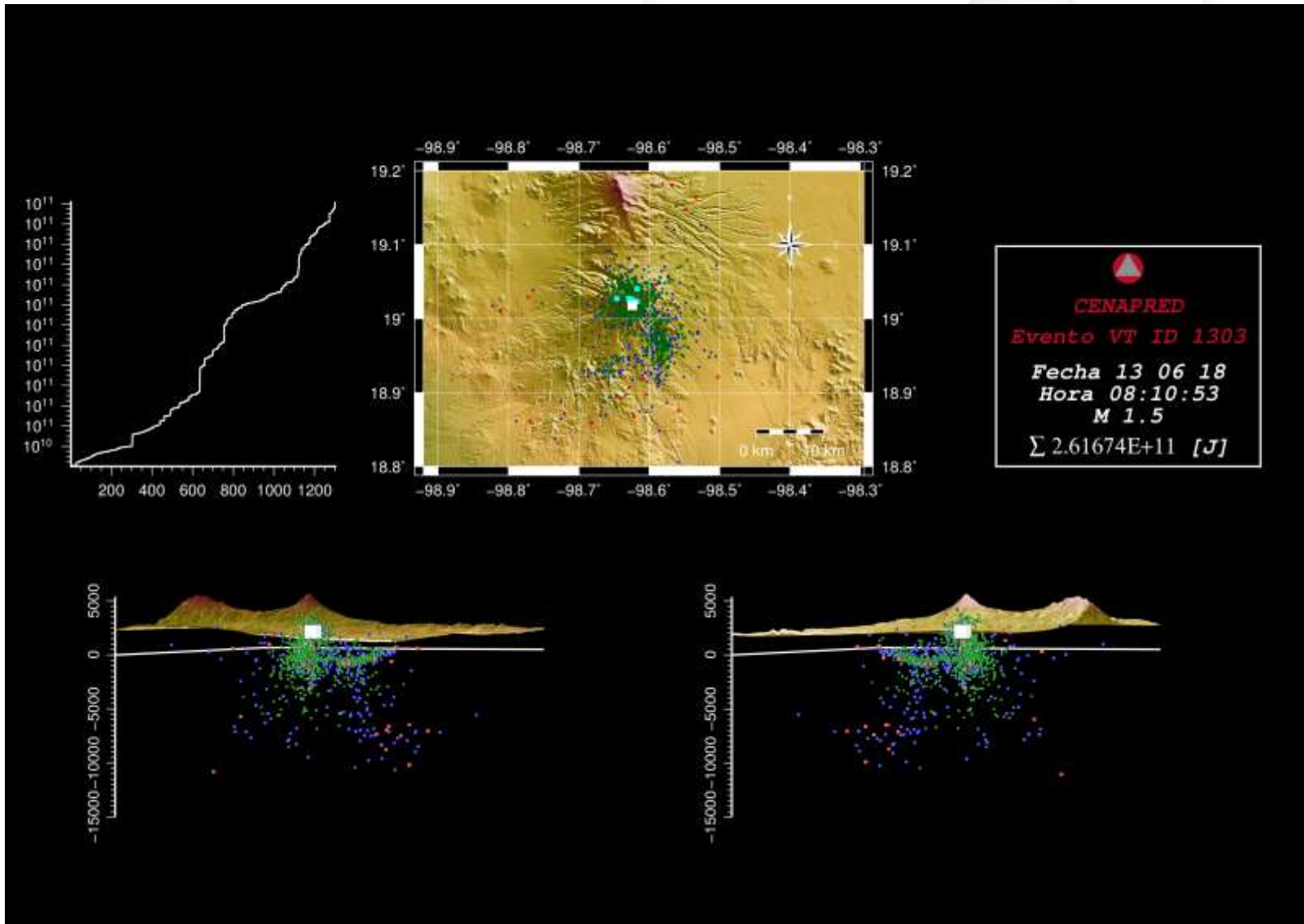


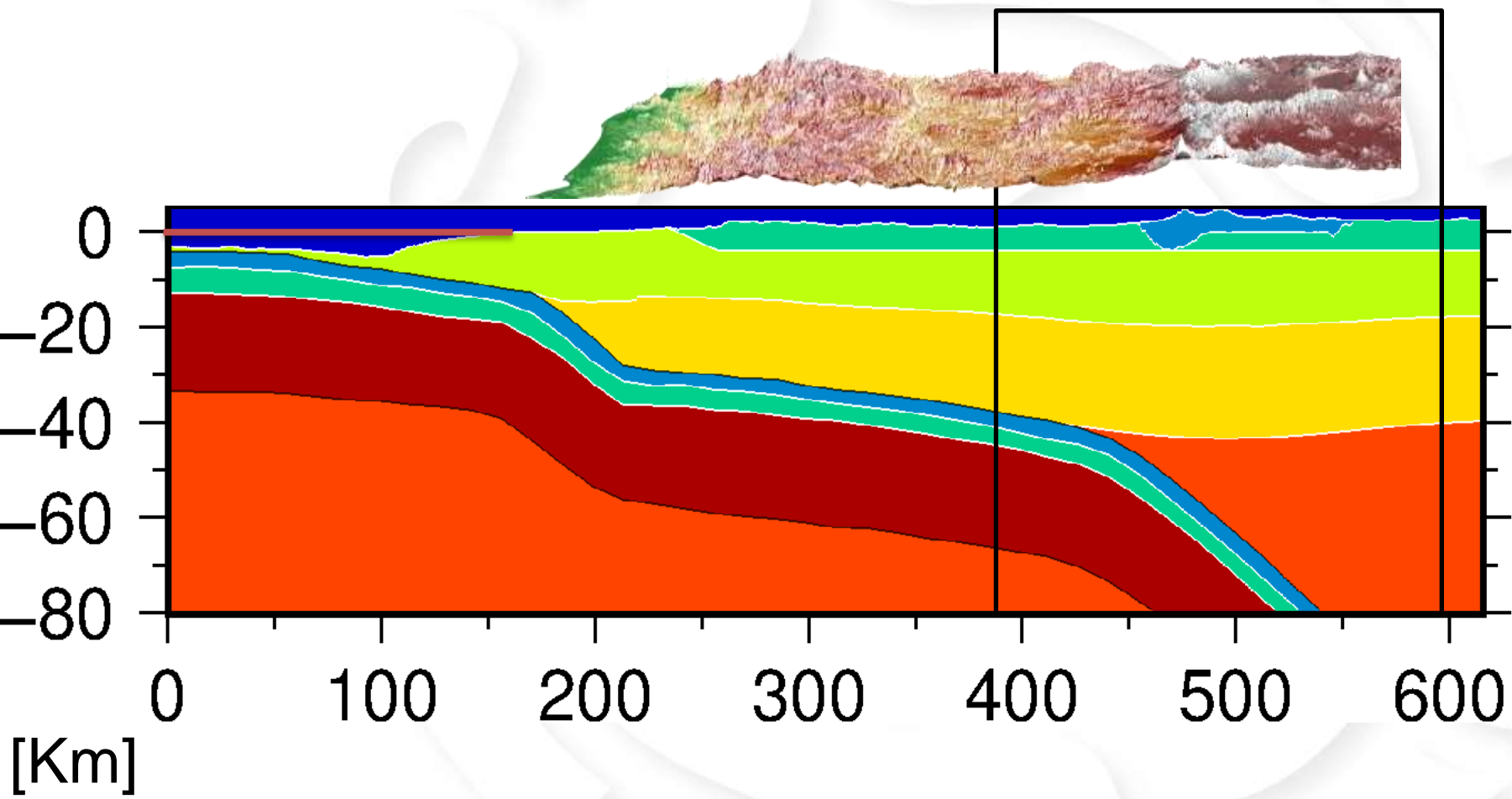


# Sismicidad registrada en el volcán Popocatepétl

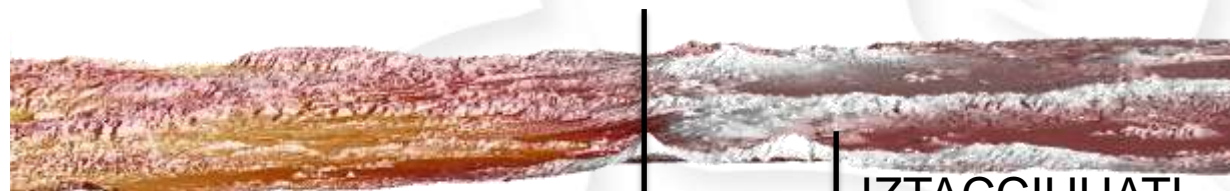








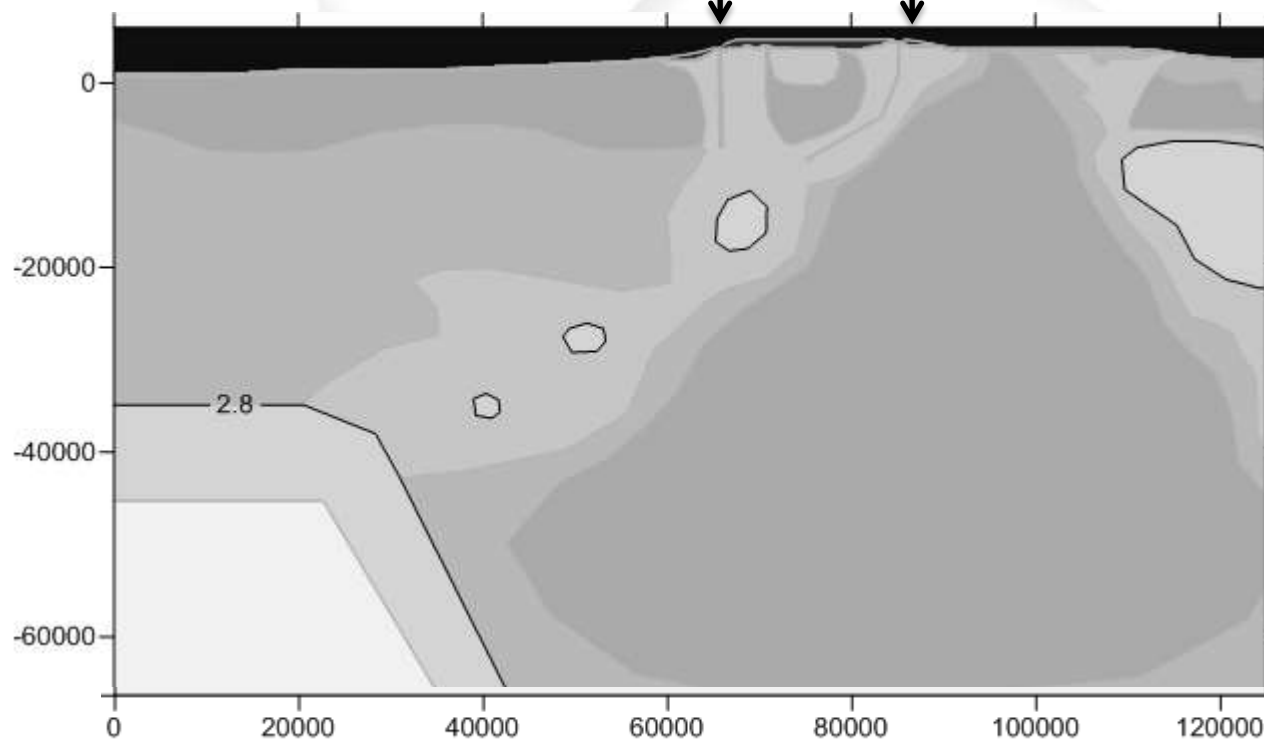
POPOCATÉPETL



IZTACCIHUATL

Sur

Norte

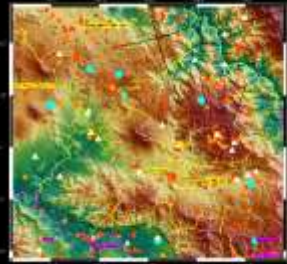


[m]

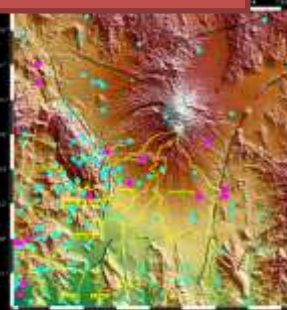
### Planes Aluviales

### Principales ciudades

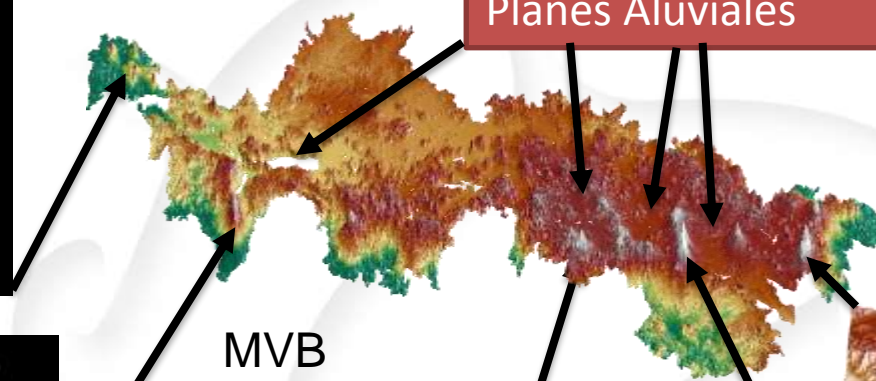
- México
- Toluca
- Puebla
- Guadalajara



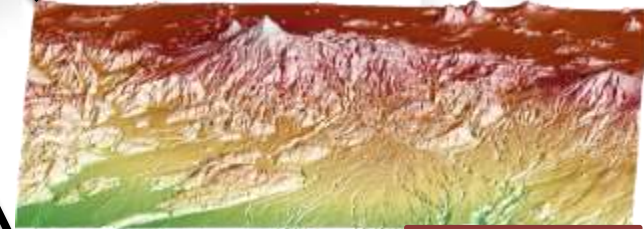
Ceboruco



Fuego



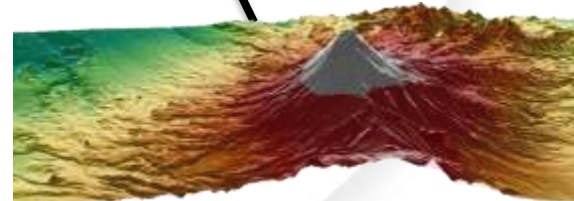
MVB



Citlaltépetl



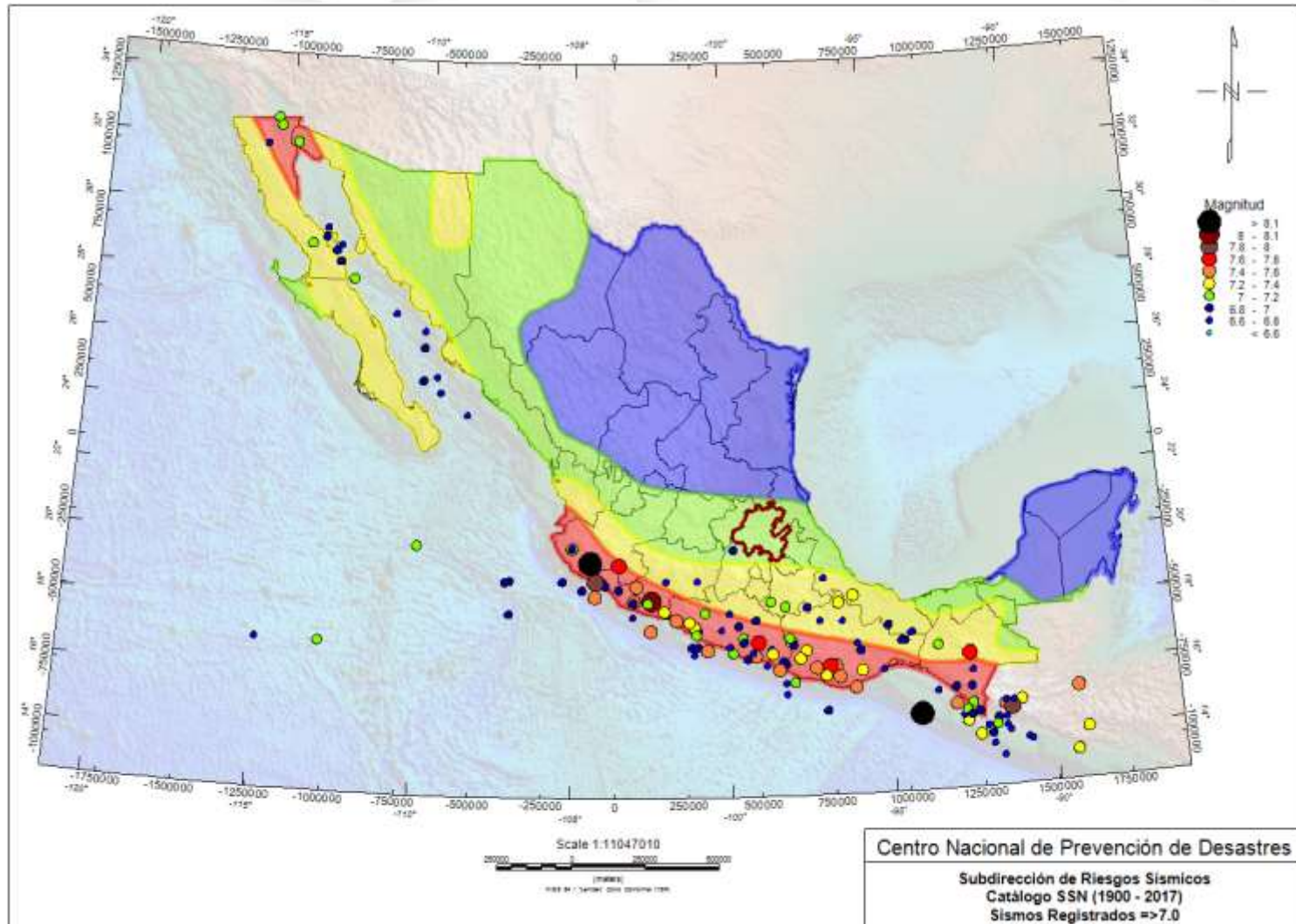
Nevado de Toluca



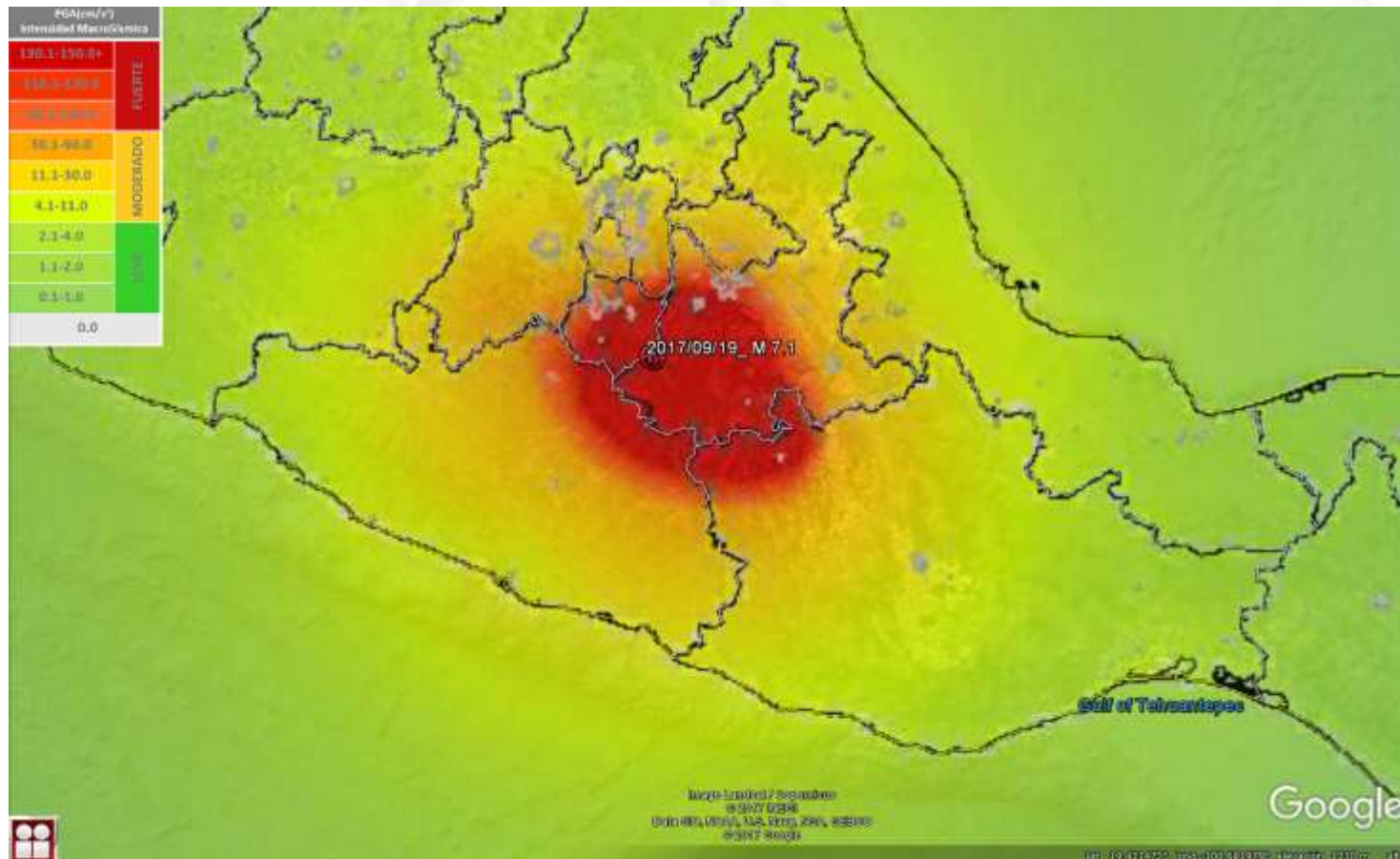
Popocatépetl

Población ~ 47,821,936 en 2010 (INEGI)

# Peligro sísmico, ¿ha cambiado?



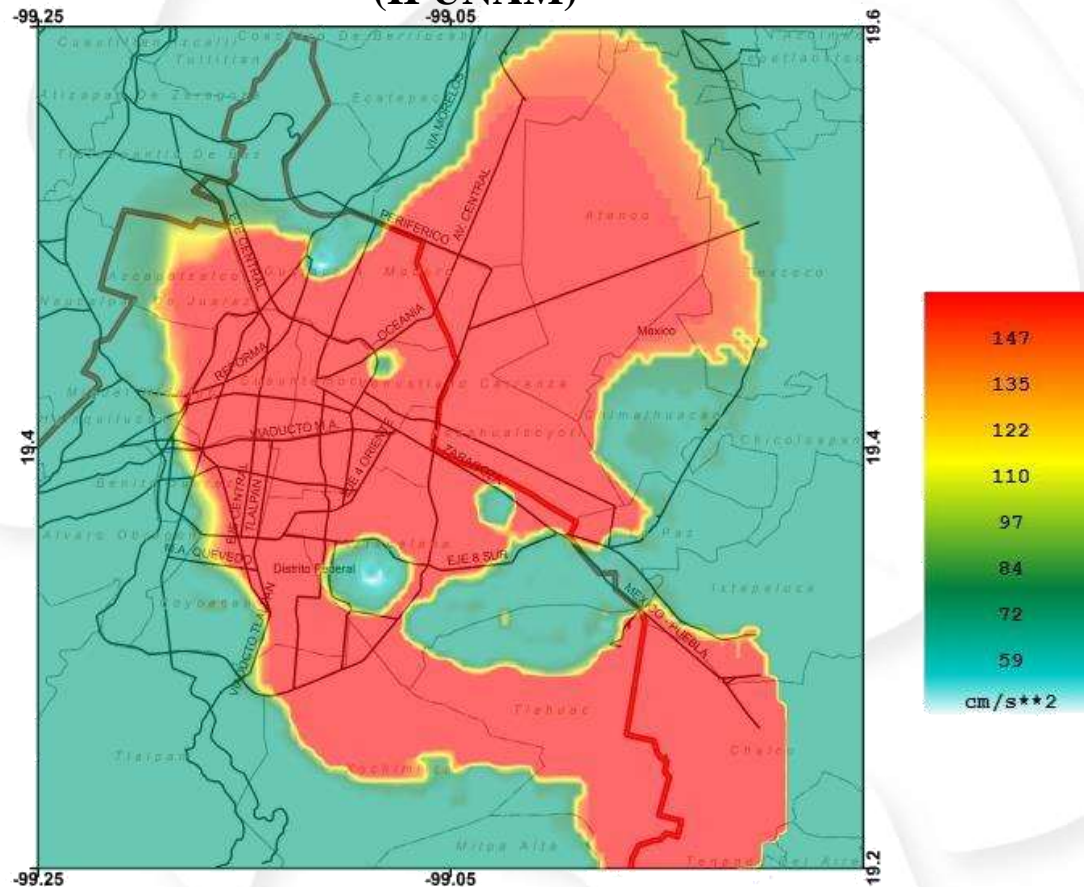
# Mapa de intensidad y aceleración del sismo del 19 de septiembre (II UNAM)



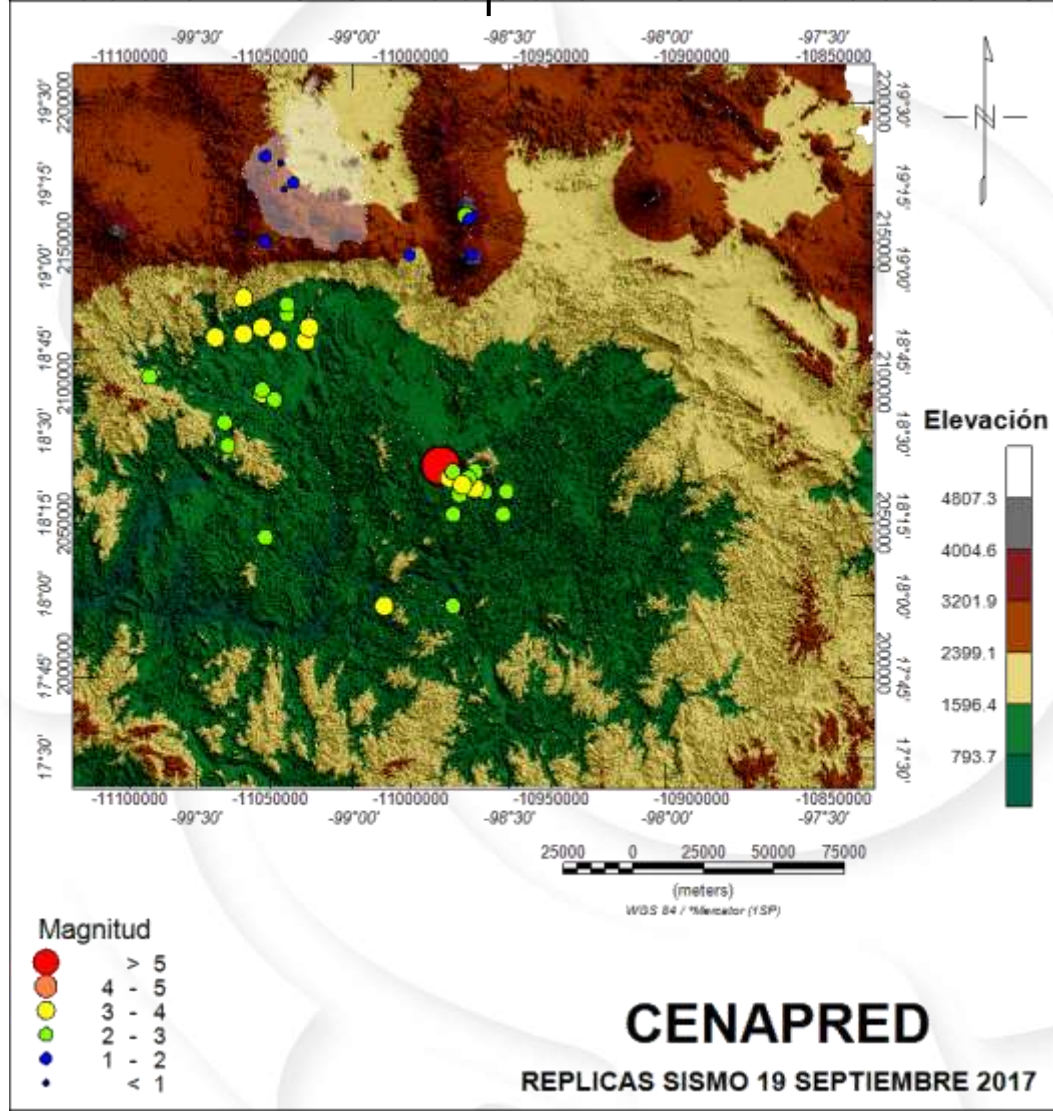
*Mapa de intensidad y aceleración máxima del suelo (PGA), estimadas para el sismo del 19 de septiembre de 2017, con magnitud 7.1 (elaborado por II UNAM con información del SSN)*

## Métodos de estimación de movimiento fuerte del terreno

**Shakemap PGA [gals]**  
**Sismo de Morelos-Puebla**  
**Mw 7.1, 19 de septiembre 2017**  
**(II UNAM)**

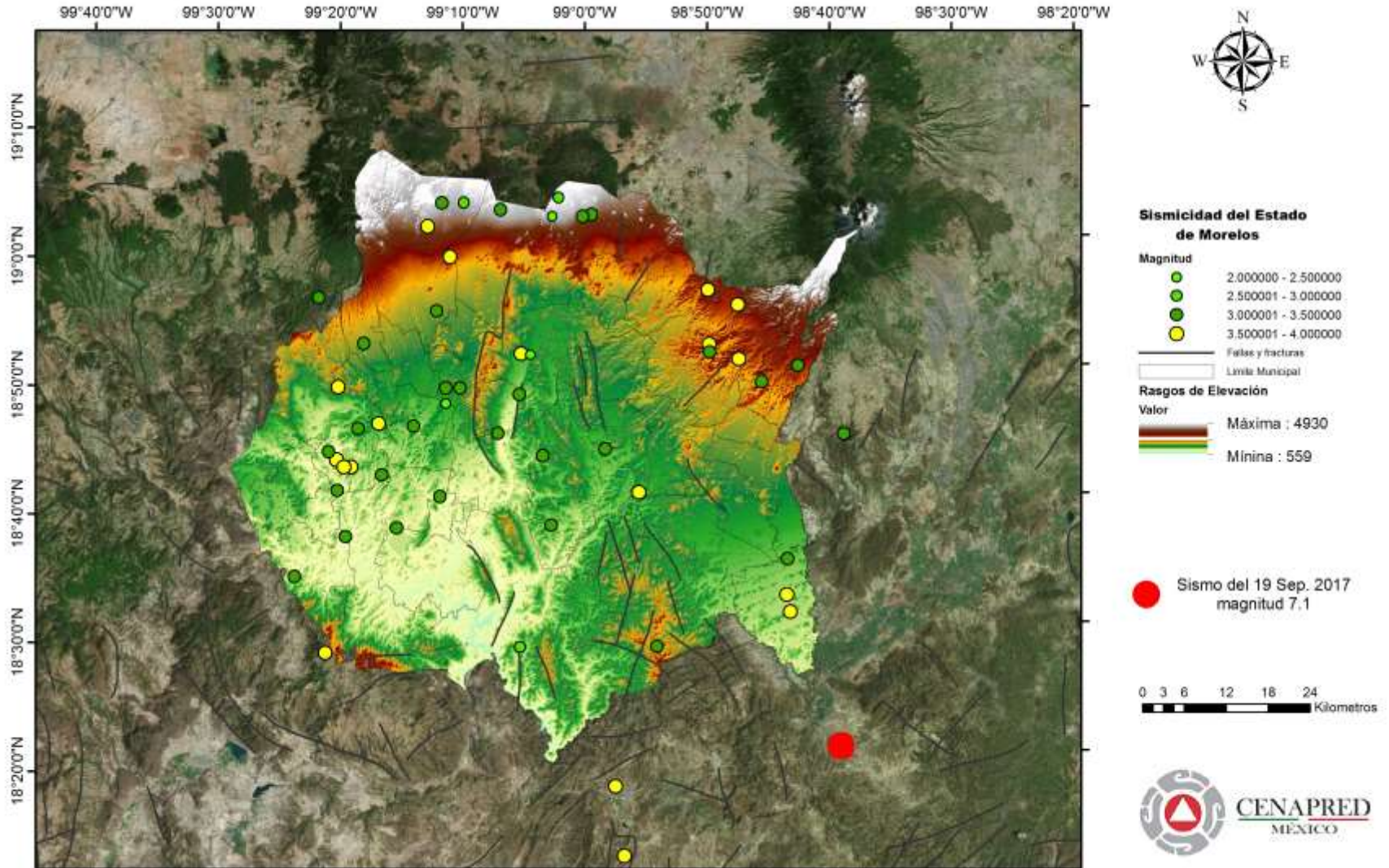


# Sismo del 19 de septiembre M7.1 13 réplicas al 10 de septiembre a las 05:00 horas

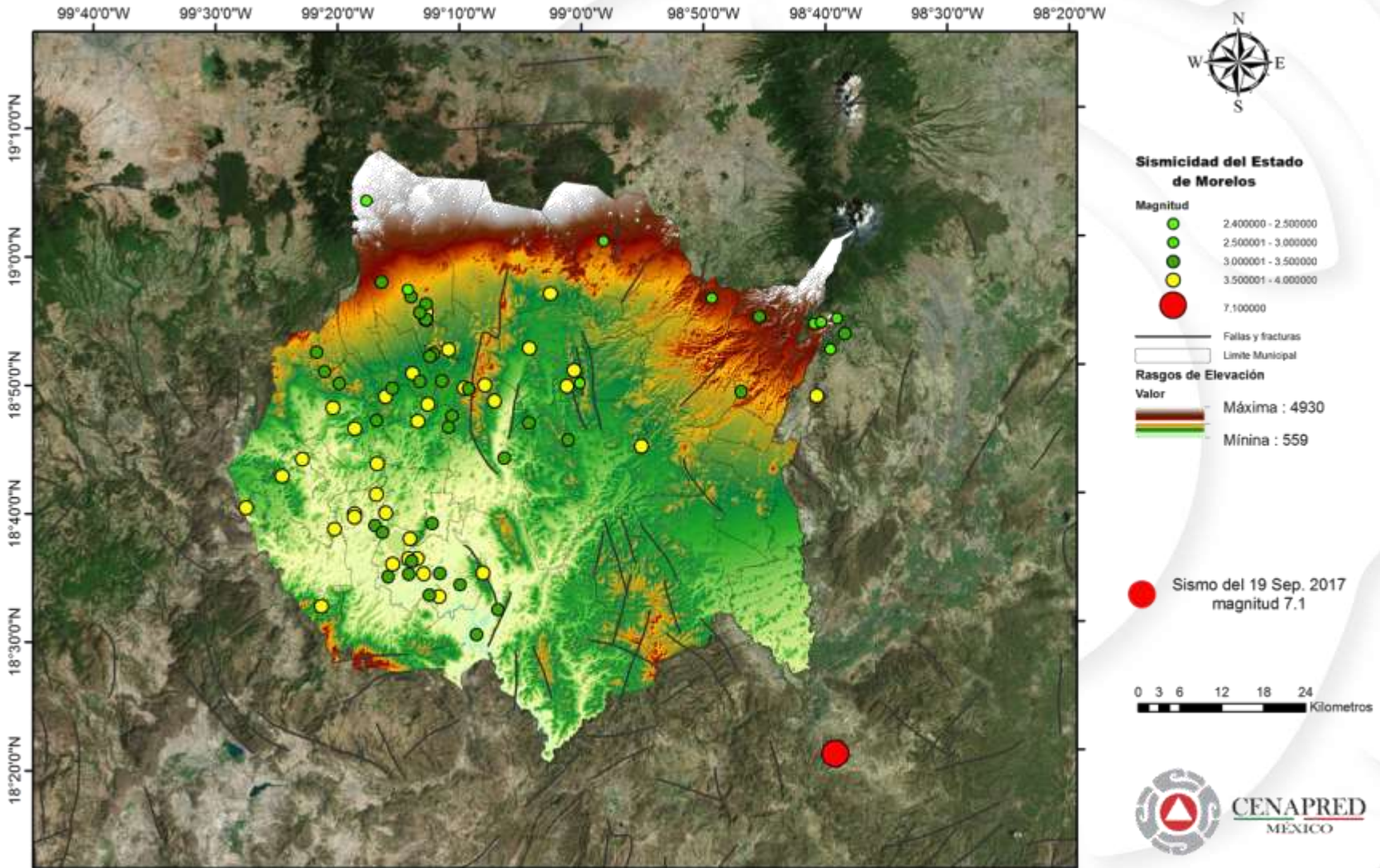




# Antes del sismo



# Después del sismo

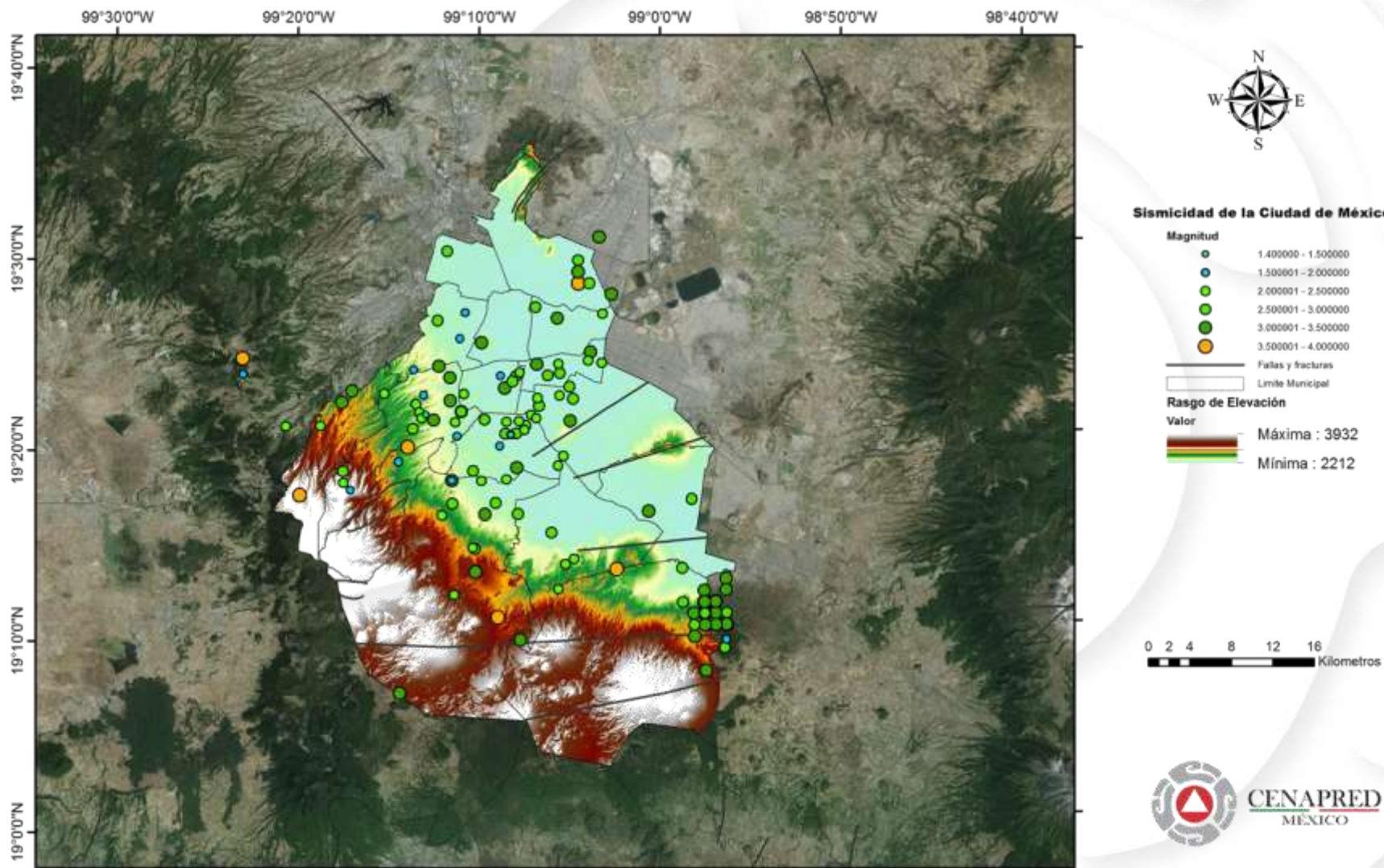


# Sismicidad en el estado de Morelos

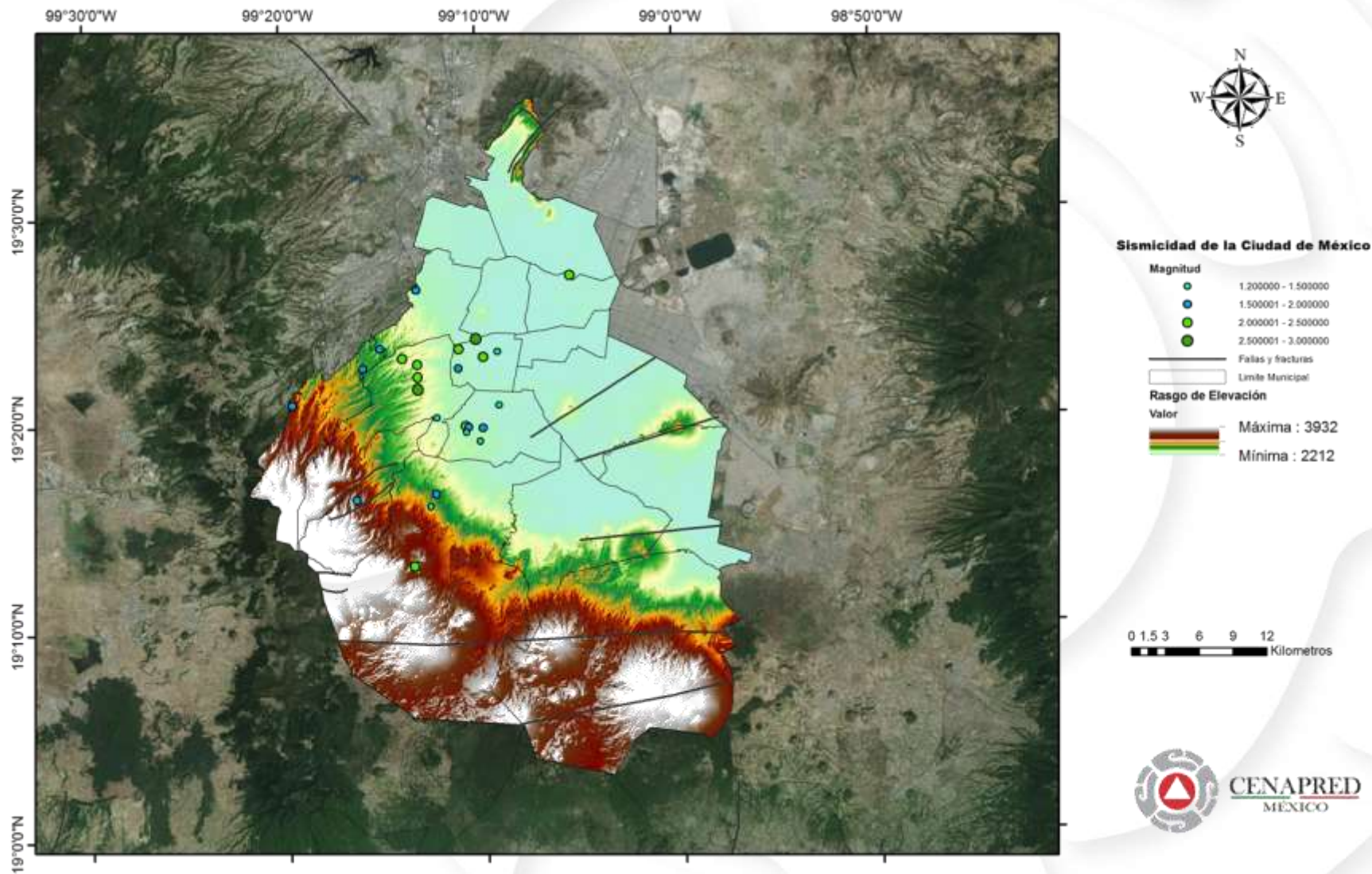
Eventos acumulados – Previo al sismo del 19 de septiembre se observa una pendiente constante. Este evento produjo una actividad inusual en fallas locales. Posteriormente se han presentado 65 sismos, el mayor de M3.9 el 20 de septiembre



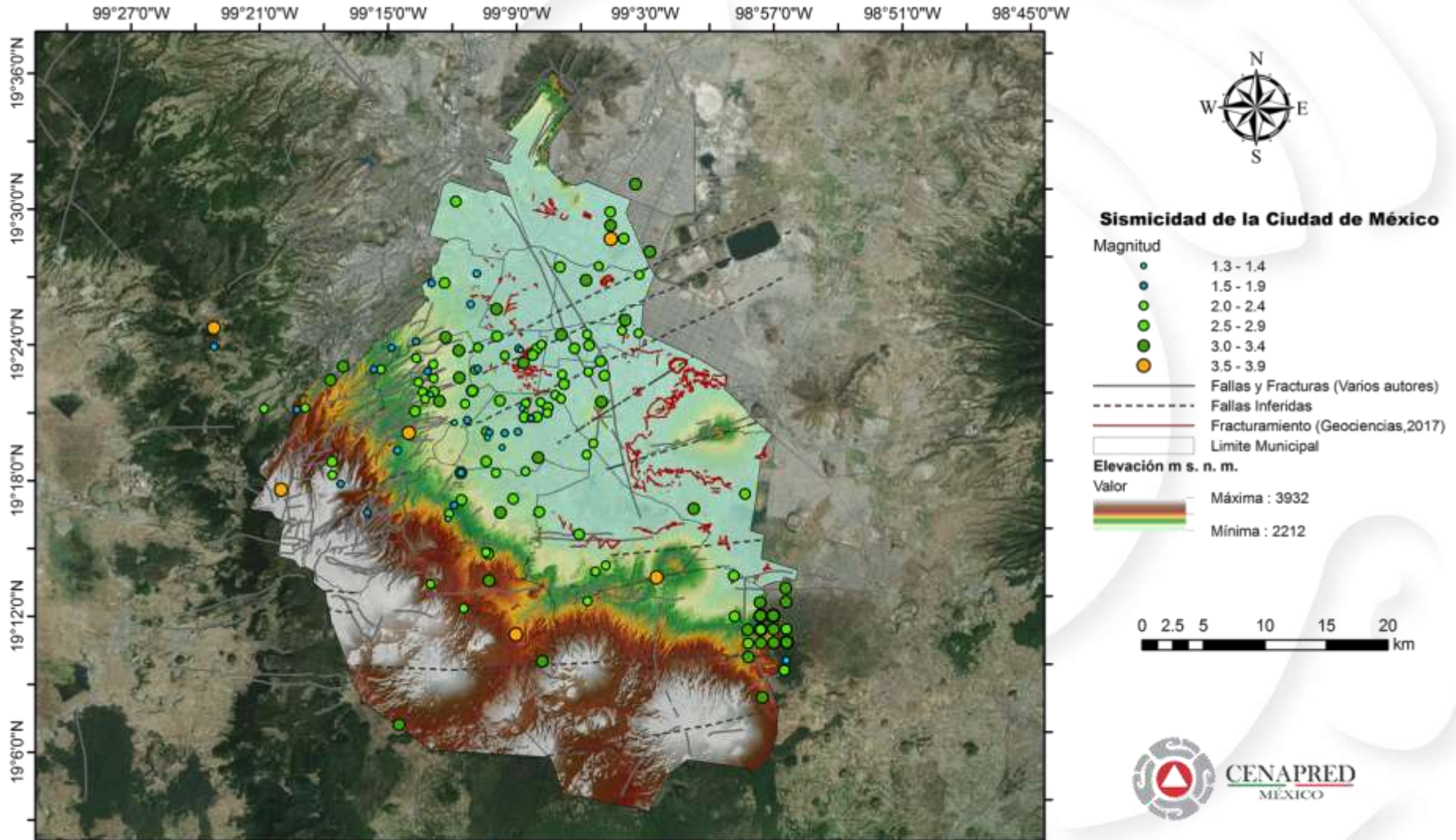
# Antes del sismo



# Después del sismo



# Sismos, fallas y fracturas en la CDMX





COORDINACIÓN NACIONAL DE  
PROTECCIÓN CIVIL  
MÉXICO

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**SEGOB**  
SECRETARÍA DE GOBERNACIÓN



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Subdirector de riesgos sísmicos

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[www.segob.gob.mx](http://www.segob.gob.mx)

 @segob\_mx

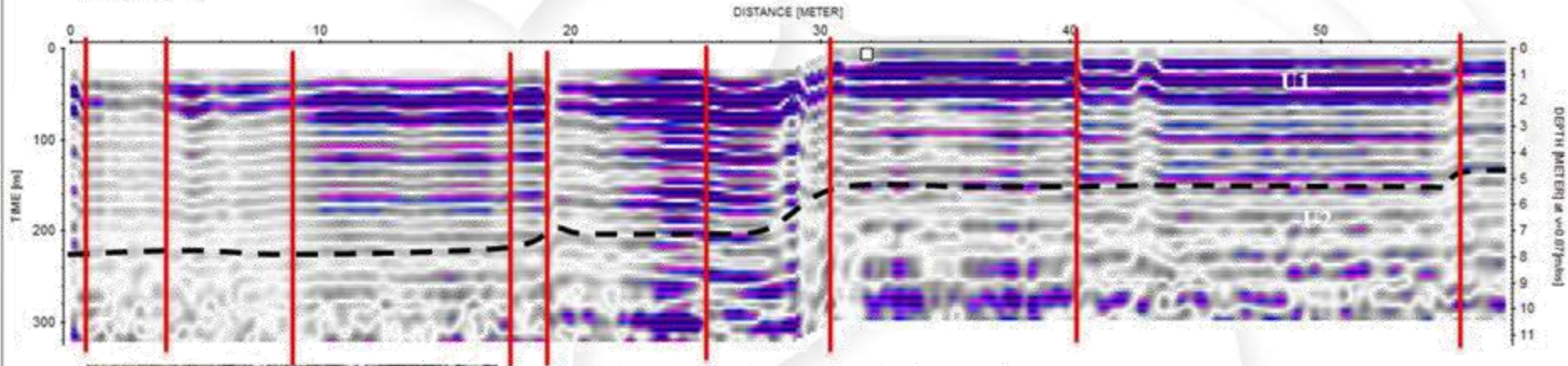
protección civil federal:

[www.proteccioncivil.gob.mx](http://www.proteccioncivil.gob.mx)

 @pcsegob

# ESTUDIO GEOFÍSICO EN LA DELEGACIÓN XOCHIMILCO, CDMX

## GPR-1



### Simbología

- Interpretación
- Efecto asociados a discontinuidades por posibles asentamientos del suelo
- U Unidades litológicas
- GPR\_0m
- GPR\_50m
- Línea GPR
- ↓ Sitio recomendado para exploración directa, perforación min 30m.