

# Case study: Rancho Nuevo, Celaya, Gto.



**GEOTEMA**

Ingeniería S.A. de C.V.





# Case study: Rancho Nuevo





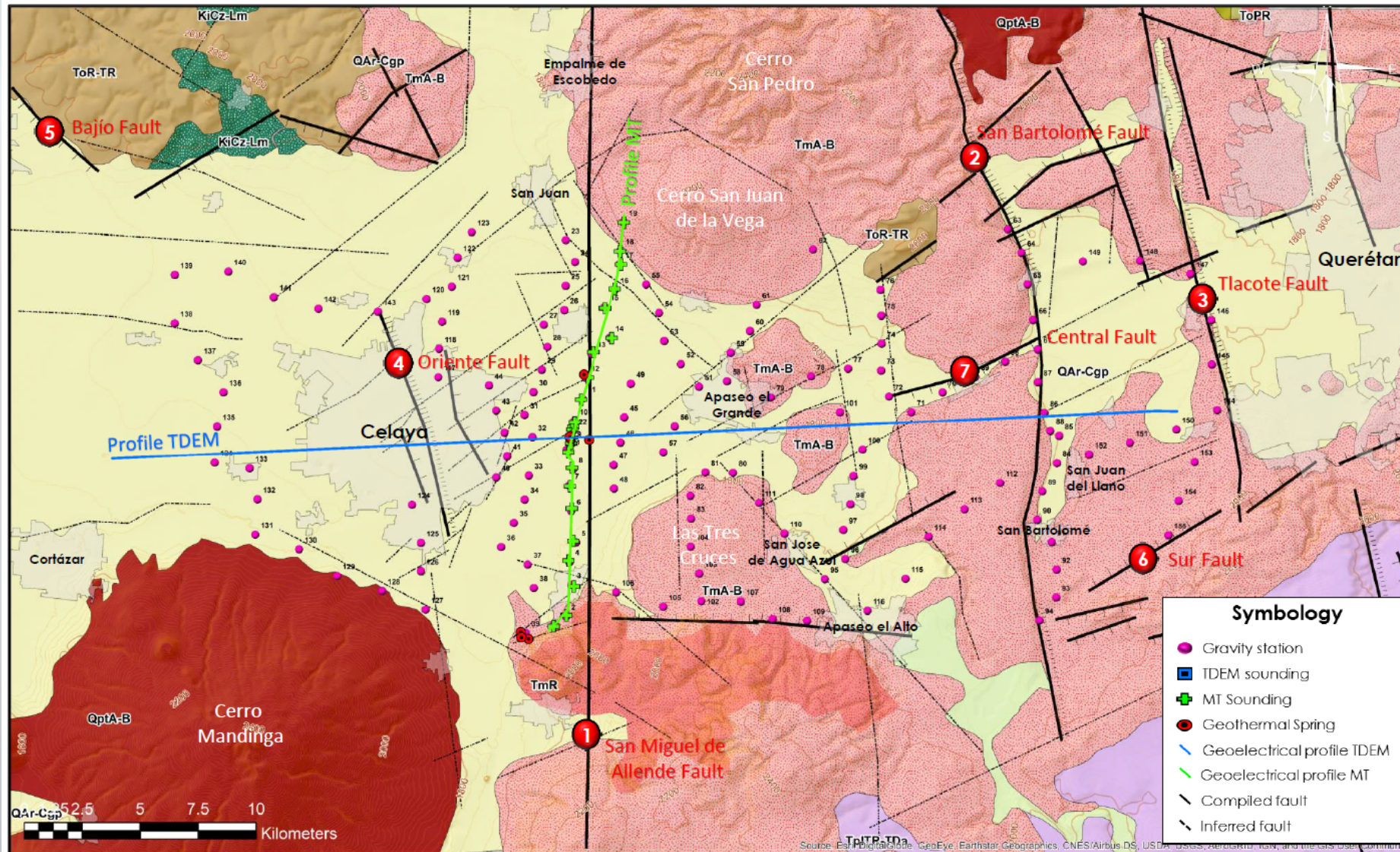
# Case study: Rancho Nuevo



## Manifestación Hidrotermal Rancho Nuevo



# Geological Setting



## Lithology

### Quaternary

TplQAr Cgp	SANDSTONE CONGLOMERATE
QptA-B	ANDESITE BASALT

### Tertiary

ToR-TR	RHYOLITE TUFF RHYOLITE
TplTR TDa	TUFF RHYOLITE DACITE
TmA-B	ANDESITE BASALT

### Cretaceous

#### Higher

Ks Cz-Lu	LIMESTONE SHALE
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#### Lower

KCz-Lm	LIMESTONE SILSTONE
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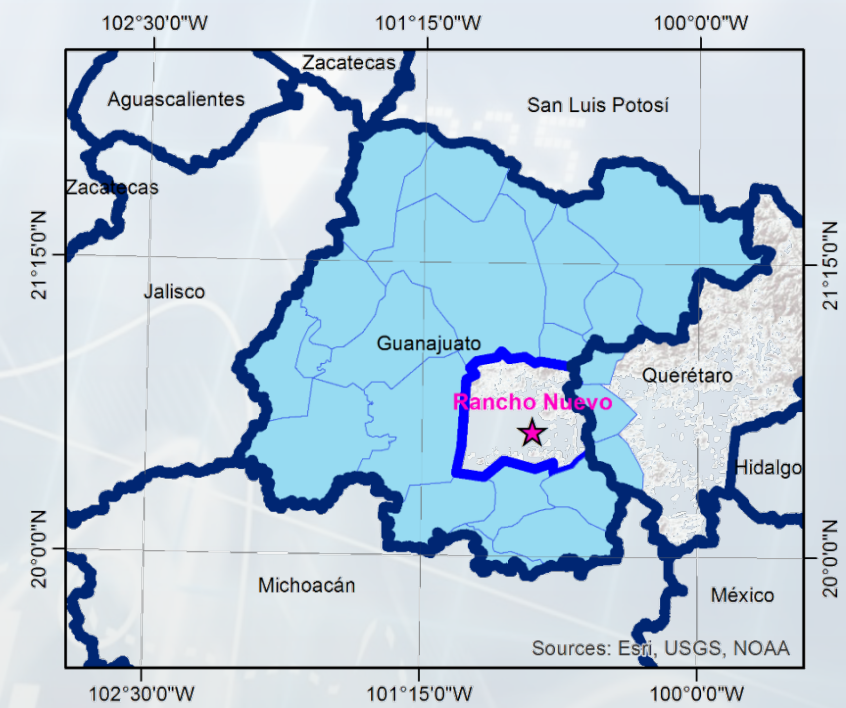
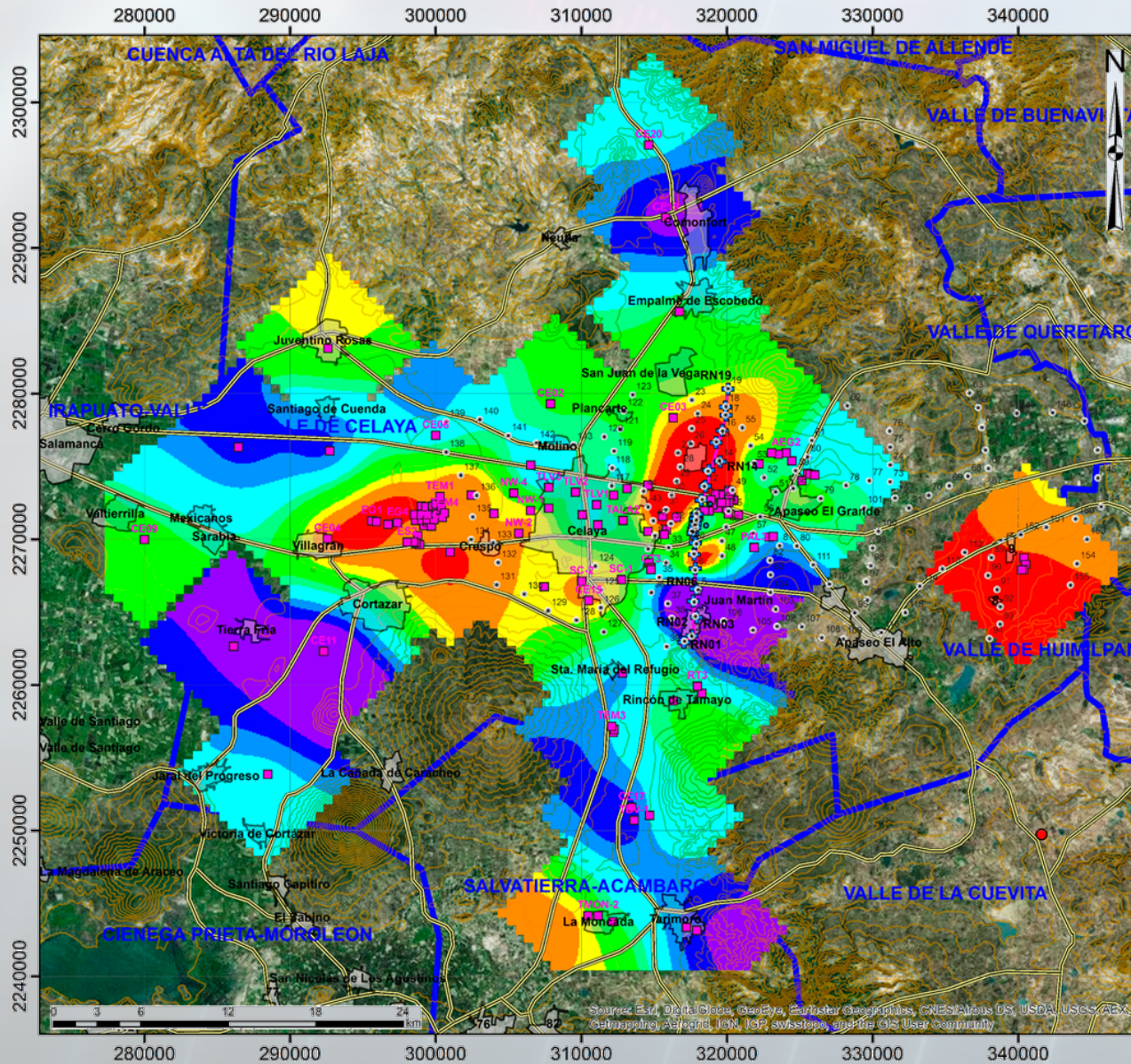
## Symbology

- Gravity station
- TDEM sounding
- + MT Sounding
- Geothermal Spring
- Geoelectrical profile TDEM
- Geoelectrical profile MT
- Compiled fault
- - - Inferred fault

Source: Esri, DigitalGlobe, GeoEye, Earthstar, Geographics, CNES/Airbus DS, USDA, AeroGRID, IGN, and the GIS User Community



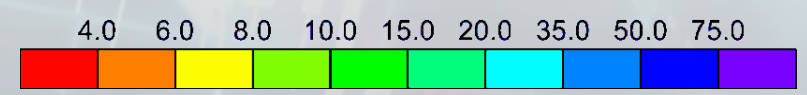
# Resistivity from TDEM (250 m)



## Simbología

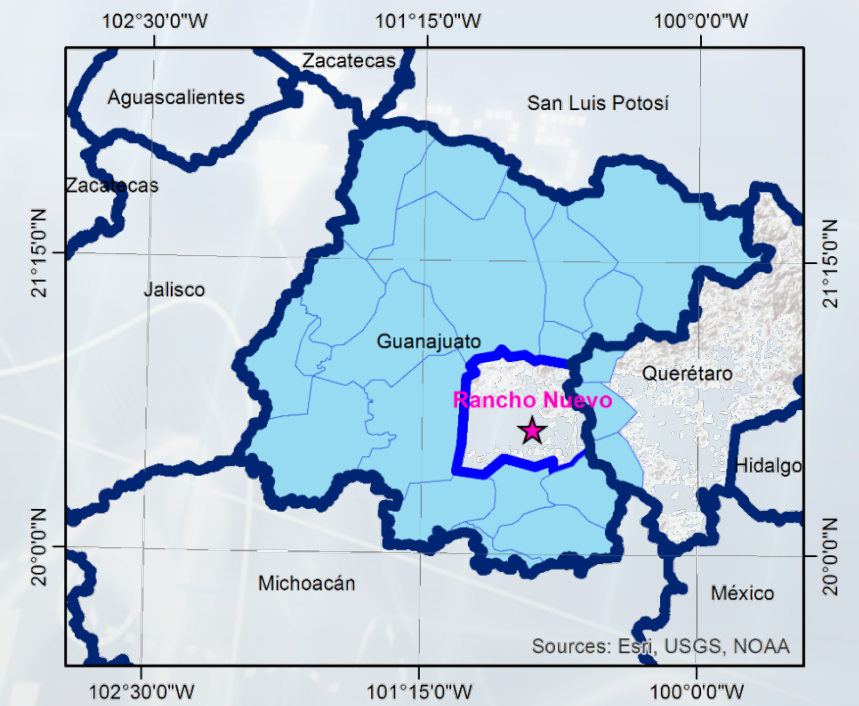
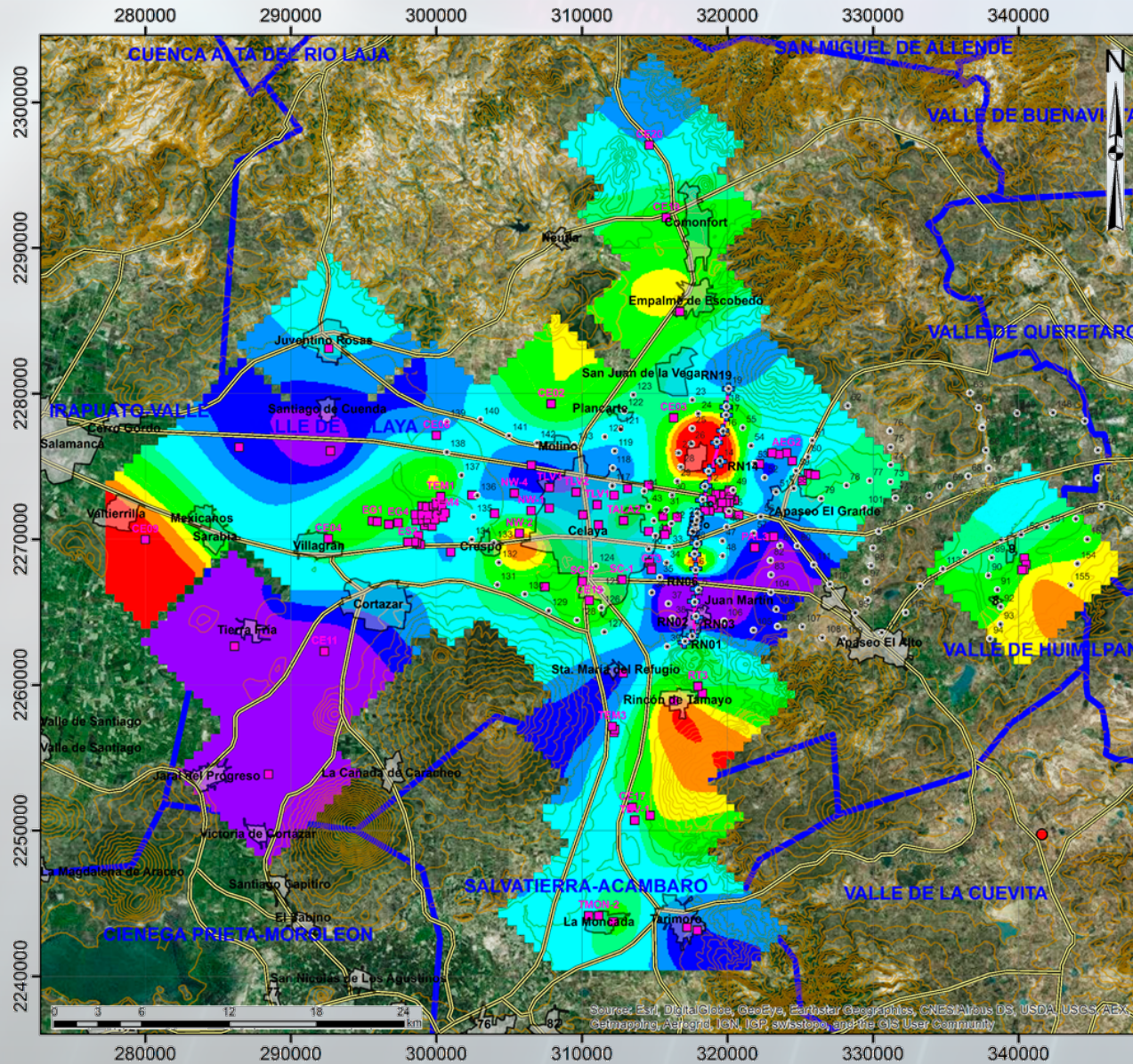
- ✚ MT\_El Salitre
- Perfiles Geoelectricos
- Estaciones GRAV
- Zona Urbana
- ✚ MT\_RanchoNuevo
- Carretera
- Sondeo TEM
- Limite Acuífero

## Resistividad Eléctrica (Ohm-m)





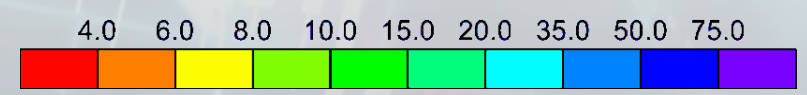
# Resistivity from TDEM (500 m)



## Simbología

- MT\_El Salitre
- Estaciones GRAV
- MT\_RanchoNuevo
- Sondeo TEM
- Perfiles Geoelectricos
- Zona Urbana
- Carretera
- Limite Acuífero

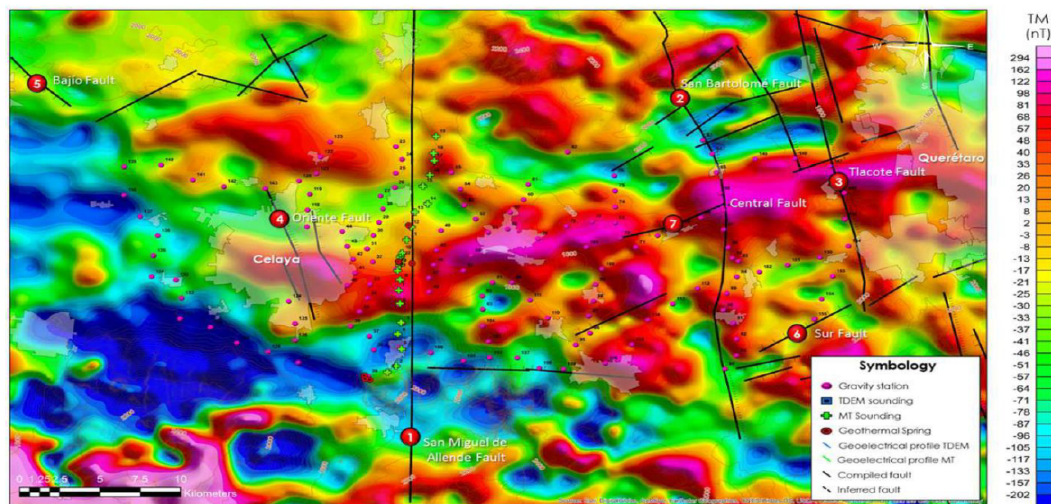
## Resistividad Eléctrica (Ohm-m)



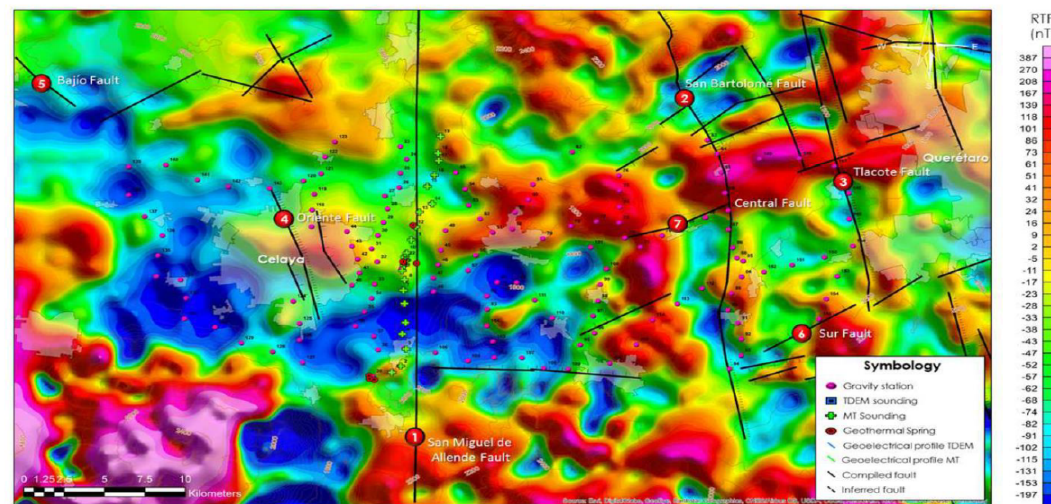


# Aeromagnetic Data (Servicio Geológico Mexicano)

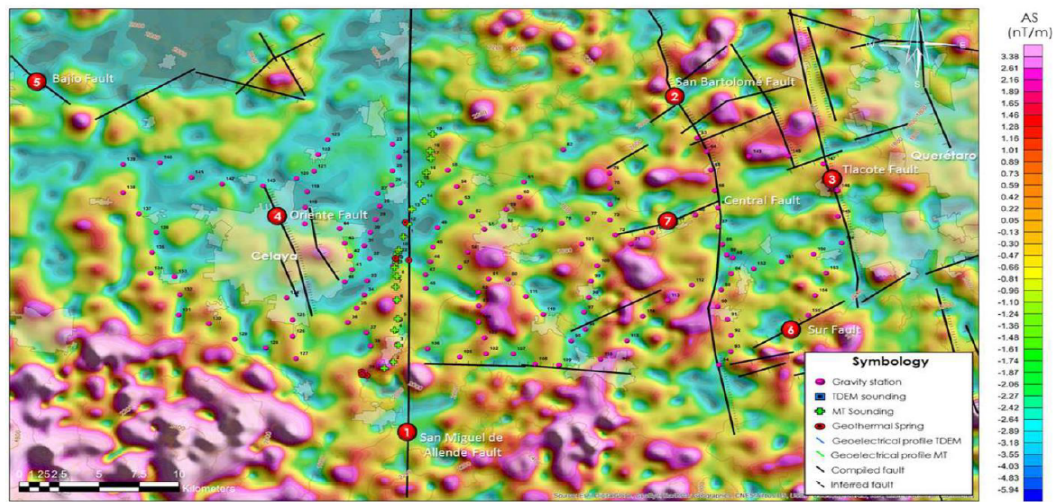
a) Total magnetic field intensity (TM)



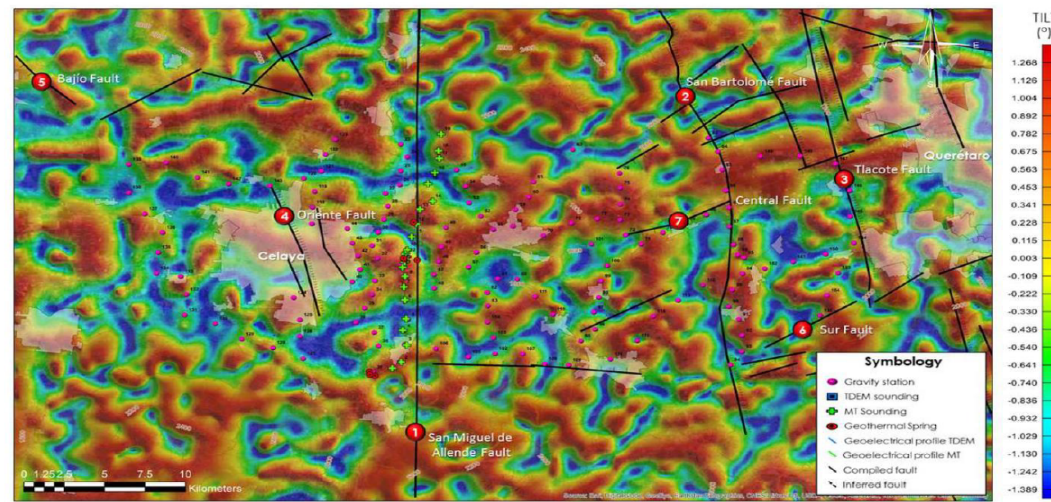
b) Reduction to the magnetic Pole (RTP)



c) Analytic signal map (SA)

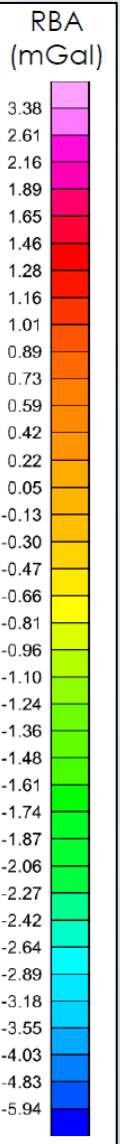
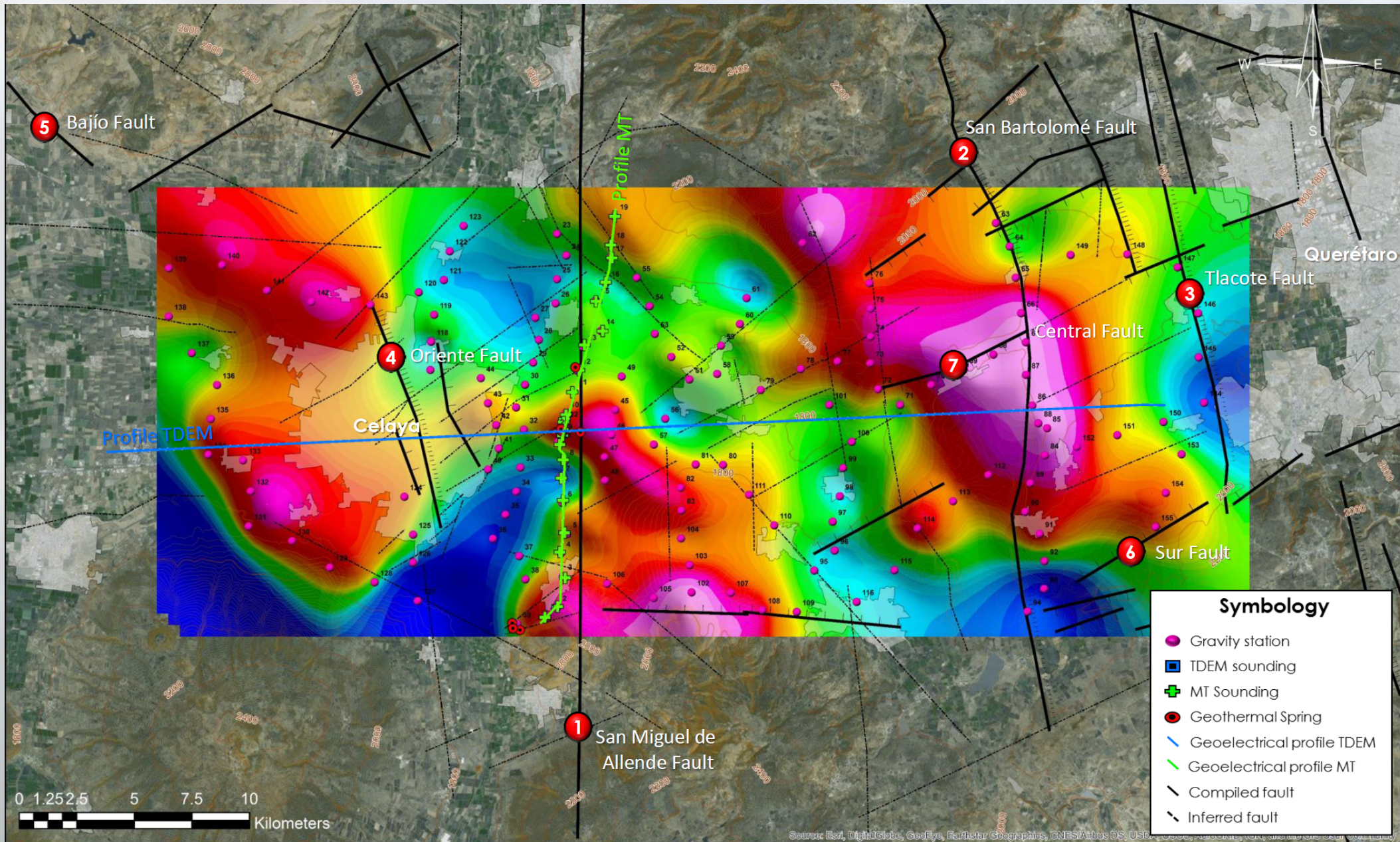


d) Tilt derivative map (TILT)





# Bouguer Residual (GEOTEM)



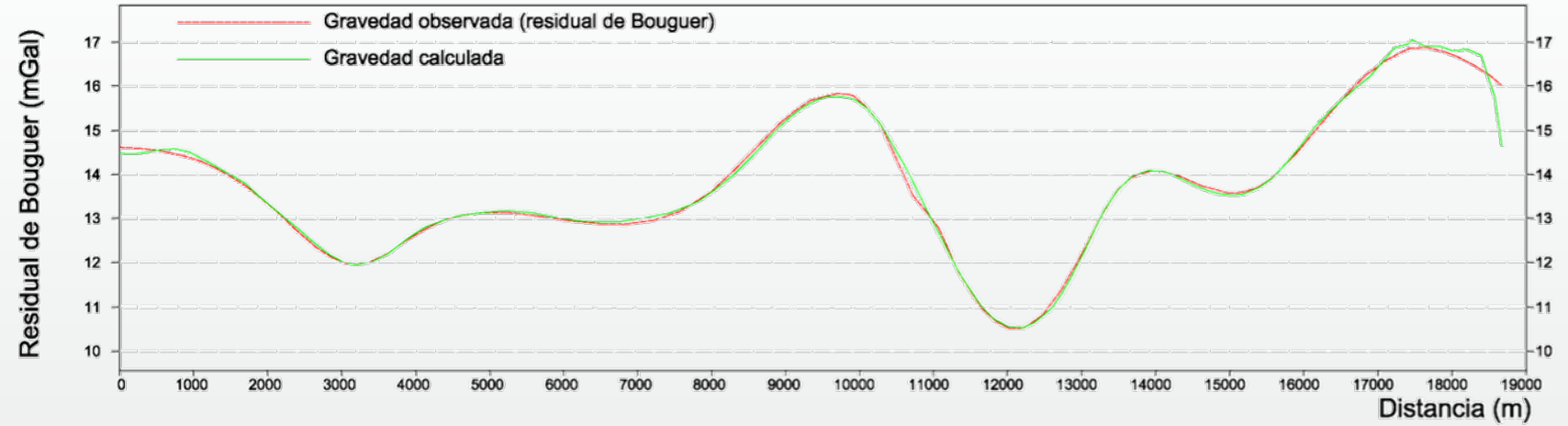
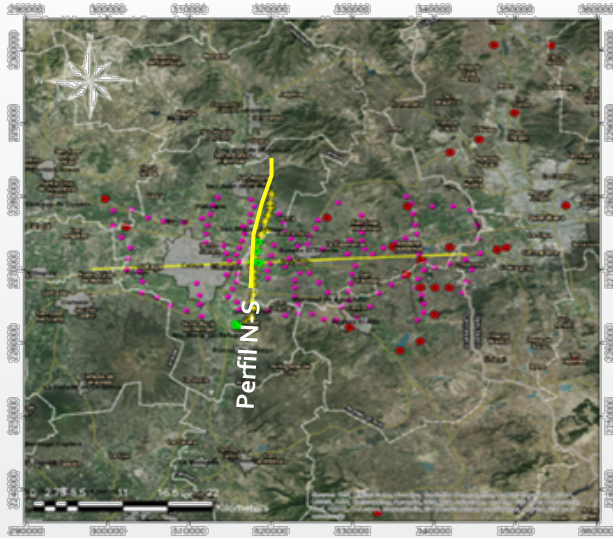
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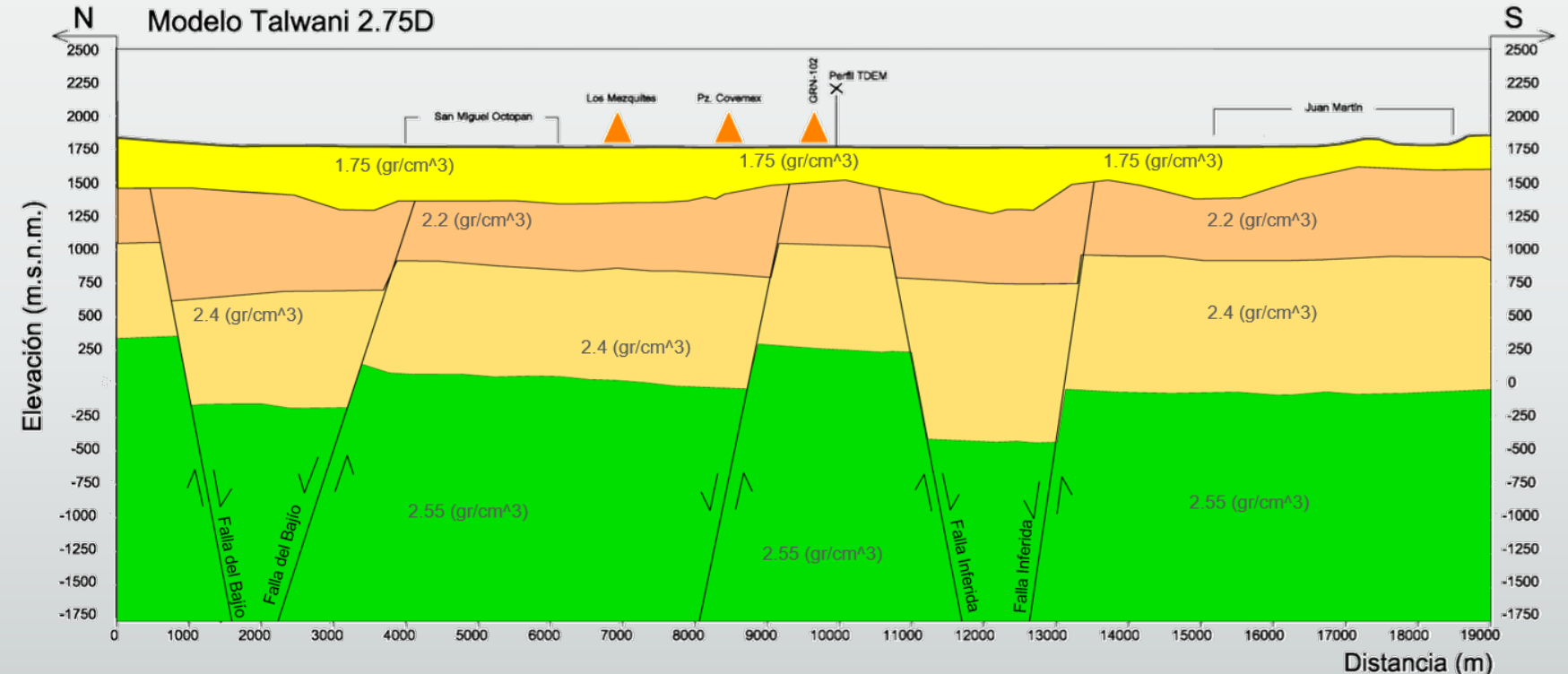




# Gravimetric Modeling Profile N-S

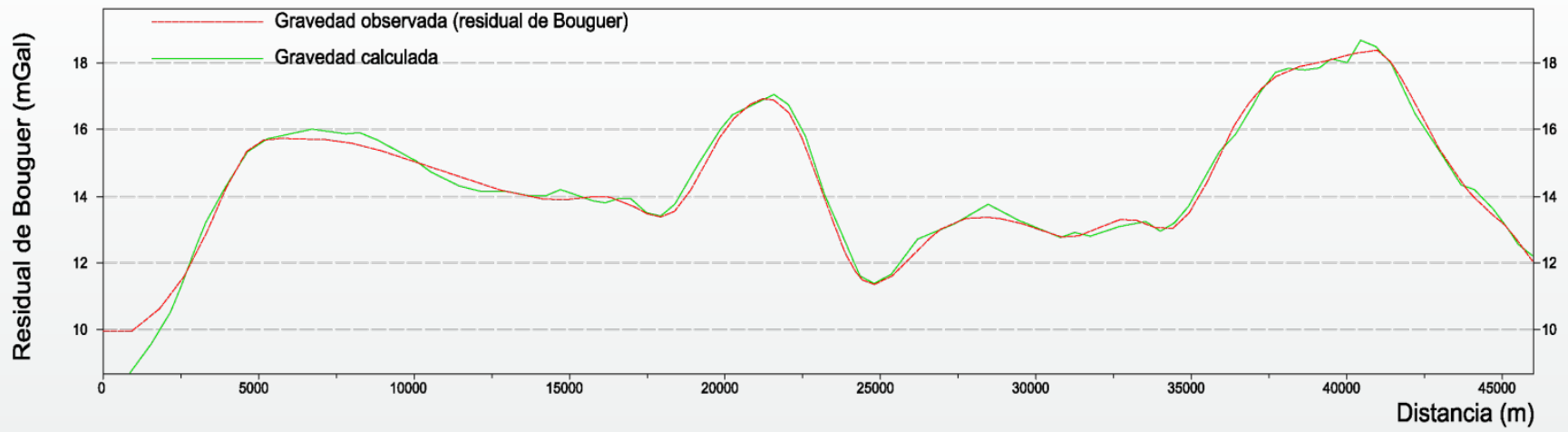
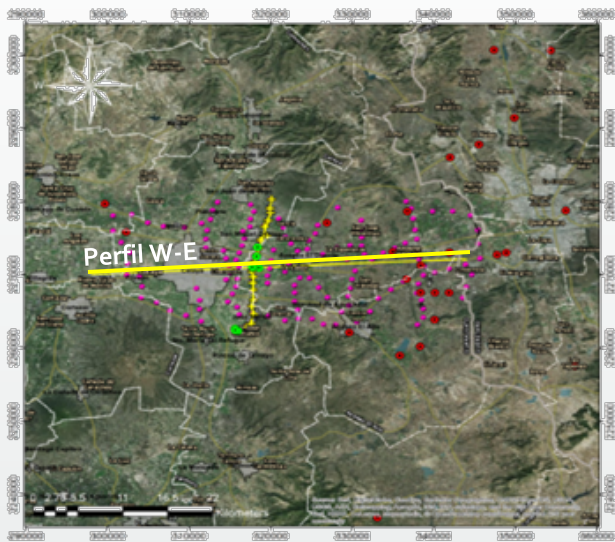


- Simbología**
- Falla Geológica
  - Posible continuidad de falla
  - Contacto entre unidades
  - Manifestación geotérmica
  - Poblado
  - Cruce de perfil
- Litología**
- 2.2 Relleno Cuaternario
  - 2.1 Basalto Cuaternario
  - 2.2 Andesita - Basalto fracturado Terciario
  - 2.4 Andesita-Basalto-Riolita Terciaria
  - 2.55 Basamento Cretácico

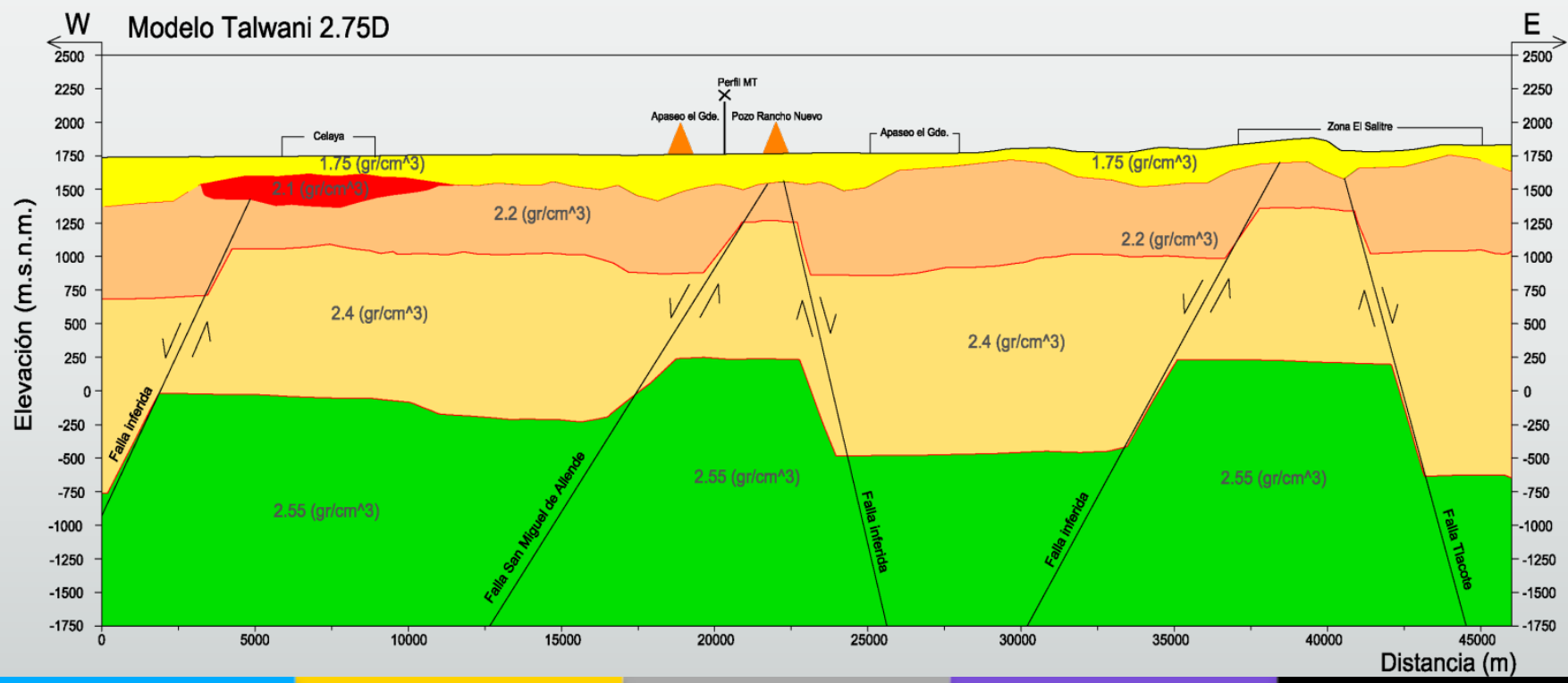




# Gravimetric Modeling Profile W-E



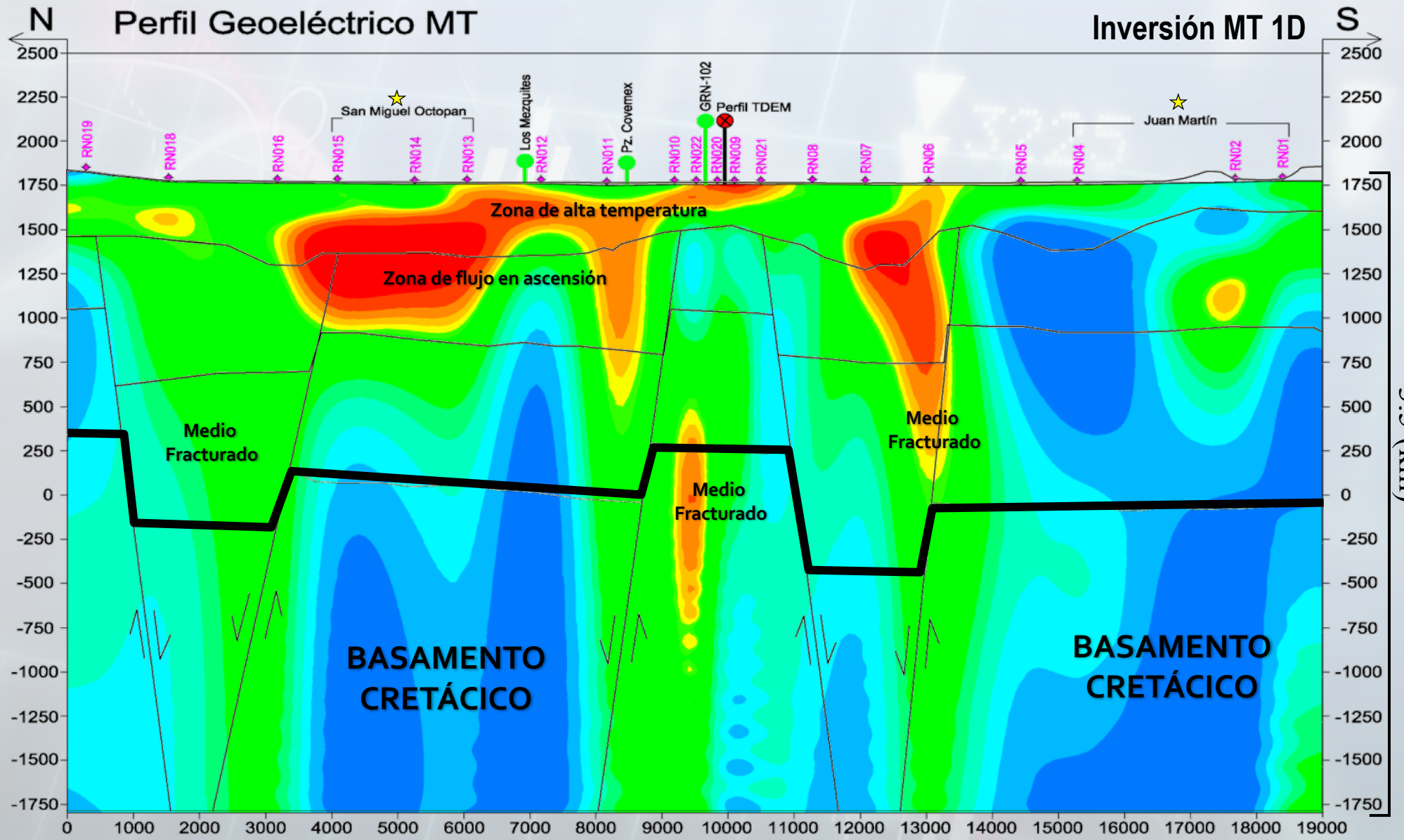
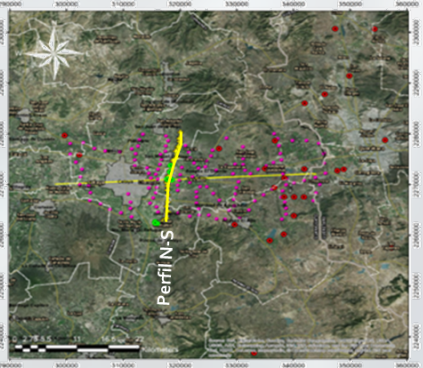
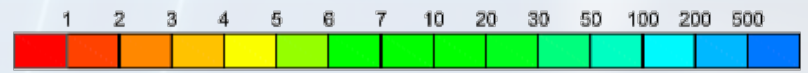
- Simbología**
- Falla Geológica
  - Posible continuidad de falla
  - Contacto entre unidades
  - Manifestación geotérmica
  - Poblado
  - Cruce de perfil
- Litología**
- 2.2 Relleno Cuaternario
  - 2.1 Basalto Cuaternario
  - 2.2 Andesita - Basalto fracturado Terciario
  - 2.4 Andesita-Basalto-Riolita Terciaria
  - 2.55 Basamento Cretácico





# MT 1D Inversion and Gravimetric Modeling

Resistividad (Ohm-m)





## Simbología

- Sondeo TDEM
- Sondeo MT
- Manifestación Geotérmica
- Poblado
- Cruce de Perfil








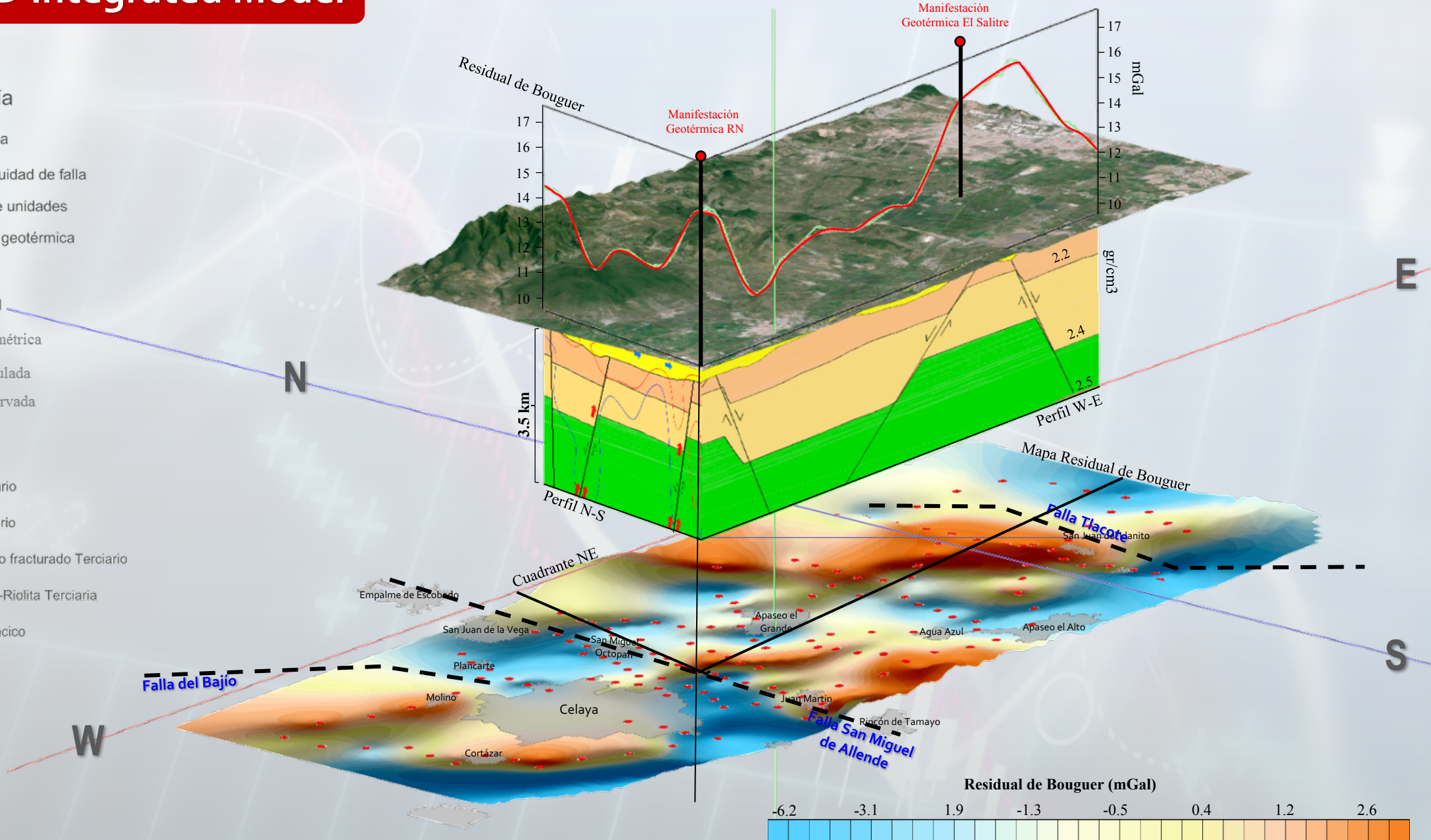
# Pseudo 3D Integrated Model

## Simbología

-  Falla Geológica
-  Posible continuidad de falla
-  Contacto entre unidades
-  Manifestación geotérmica
-  Poblado
-  Cruce de perfil
-  Estación gravimétrica
-  Anomalía calculada
-  Anomalía observada

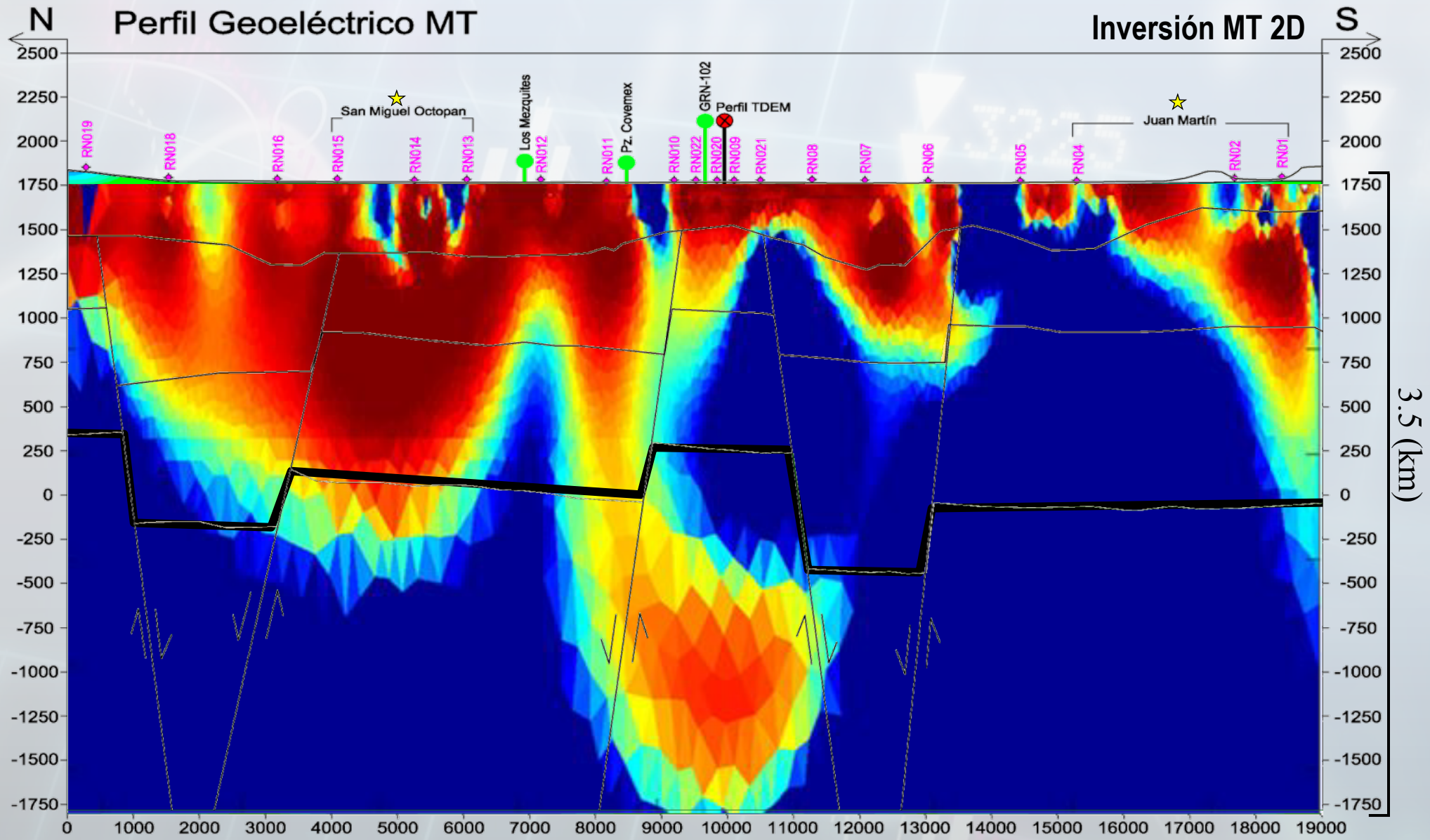
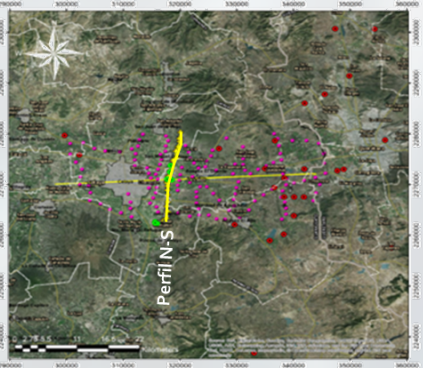
## Litología

-  2.2 Relleno Cuaternario
-  2.1 Basalto Cuaternario
-  2.2 Andesita - Basalto fracturado Terciario
-  2.4 Andesita-Basalto-Riolita Terciaria
-  2.55 Basamento Cretácico





# MT 2D Inversion and Gravimetric Modeling



- Simbología**
- ◆ Sondeo TDEM
  - ⊕ Sondeo MT
  - Manifestación Geotérmica
  - ★ Poblado
  - ⊗ Cruce de Perfil