



GOBIERNO DE LA  
CIUDAD DE MÉXICO



SECRETARÍA DE GESTIÓN INTEGRAL  
DE RIESGOS Y PROTECCIÓN CIVIL



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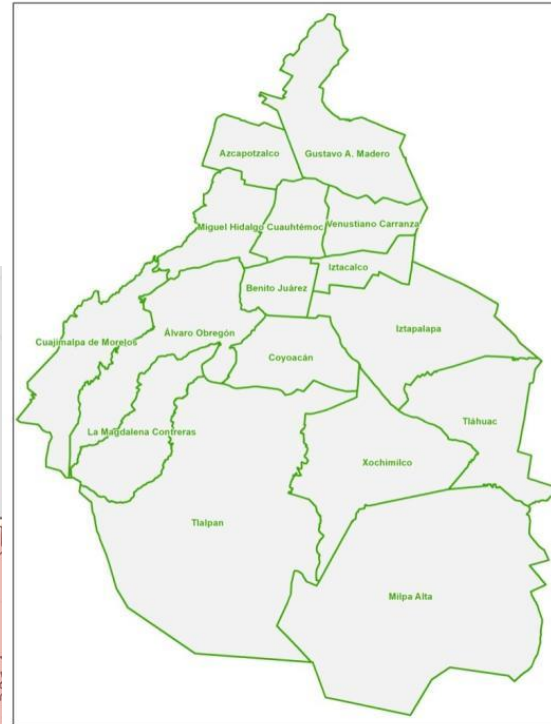
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# MEXICO CITY EARLY WARNING SYSTEM



Mexican geographical location is subject to a variety of disruptive natural phenomena that have caused major disasters. In order to protect the population and mitigate the damage caused by these phenomena, it was created the early warning systems.





# Early Warning System

The Early Warning System is a set of elements that provides timely and effective information, allowing individuals exposed to a threat to take action to avoid or reduce their risk, as well as prepare for an effective response.





**The Alert System** is promoted through information and communication technology. This should be clear and timely based on knowledge of the risk and monitoring of the potential danger and must take into account

## Their four components

**1** Knowledge and risks identification associated with disturbing phenomena to take preventive measures.



**4** Response or contingency plans for preparing drills for effective response over disturbing phenomena impacts.



**2** Measuring and Monitoring System of the disturbing phenomena to forecast or issue warnings through instruments used and telecommunication networks are used for data acquisition.



**3** Dissemination of public alerts based on clear and accurate information to the population. It requires preset and operated protocols by the authorities.



### Learn more

National Center for Disaster Prevention  
[www.gob.mx/cenapred](http://www.gob.mx/cenapred)

Source:  
National Center for Disaster Prevention

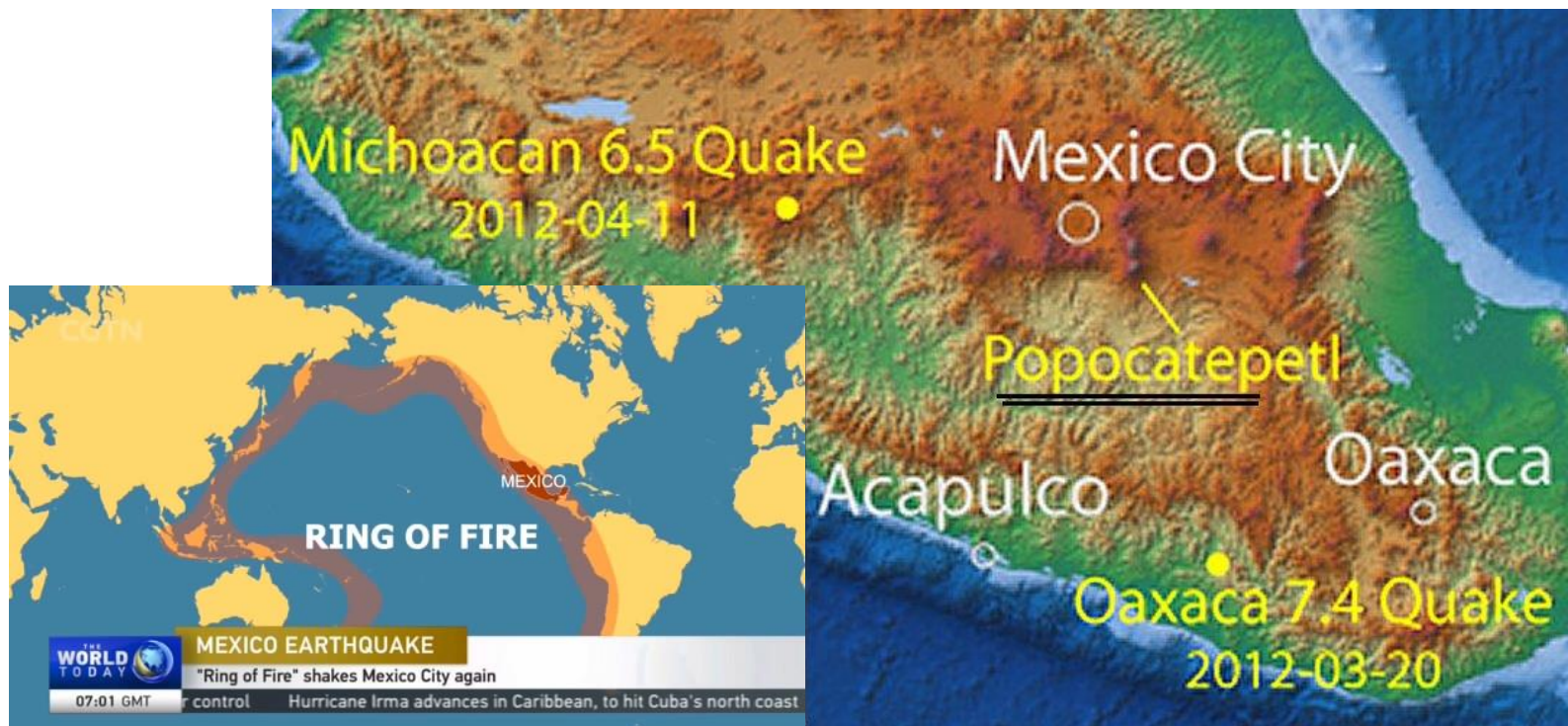
**A successful early warning system requires the coordinated participation of all sectors.**





## SISMICA CITY

The highest risk that Mexico City residents are exposed to is to earthquakes. Our country is located in the Ring of Fire where 90% of the world's seismic activity is concentrated. In this region it concentrates 452 active volcanoes, which represent almost 80% of the volcanoes worldwide







## BACKGROUND



Mexico-Tenochtitlan

Mexico-Today



## SISMICA CITY

### Types of soil in Mexico City



#### Lake Zone.

Shaking can be with an extension of up to 500 times.

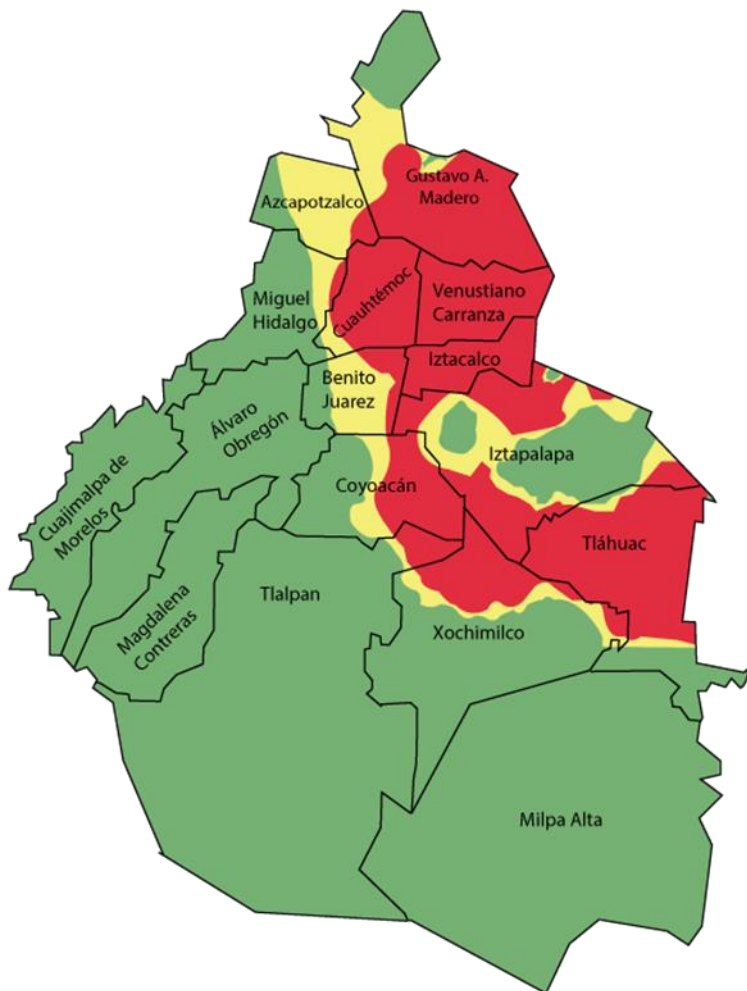


#### Transition Zone.



#### Firm Ground Zone.

Shaking is less violent.



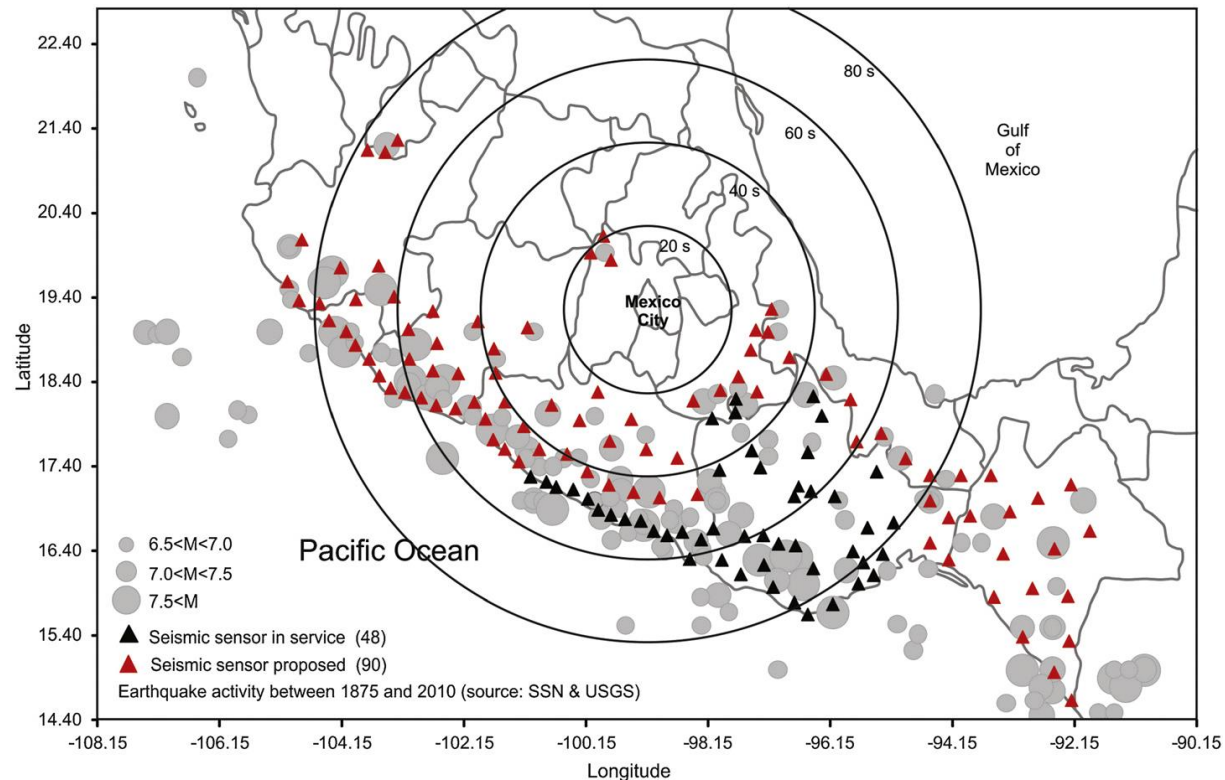




## MEXICAN SEISMIC ALERT SYSTEM

Mexico City's Seismic Alert System aims to report the proximity of a teluric movement that could put the city's population and physical infrastructure at risk.

This system permanently monitors the occurrence of earthquakes in the Mexican Pacific Coasts







## MEXICAN SEISMIC ALERT SYSTEM

The alert system activates loudspeakers located in the city's video surveillance cameras and radio receivers in buildings and public schools.



The seismic alert is activated when a mayor earthquake occurs in the region covered with SASMEX sensors, in the states of Jalisco, Colima, Michoacán, Guerrero, Oaxaca, and Puebla, also when two or more nearby sensors confirm that the magnitude of the earthquake can cause damage.

It is issued only by the Seismic Registration and Instrumentation Center A.C. (CIRES).



The Early Warning System includes the **notices and notifications**, provided by Integral Risk Management and Civil Protection authorities, during massive events.

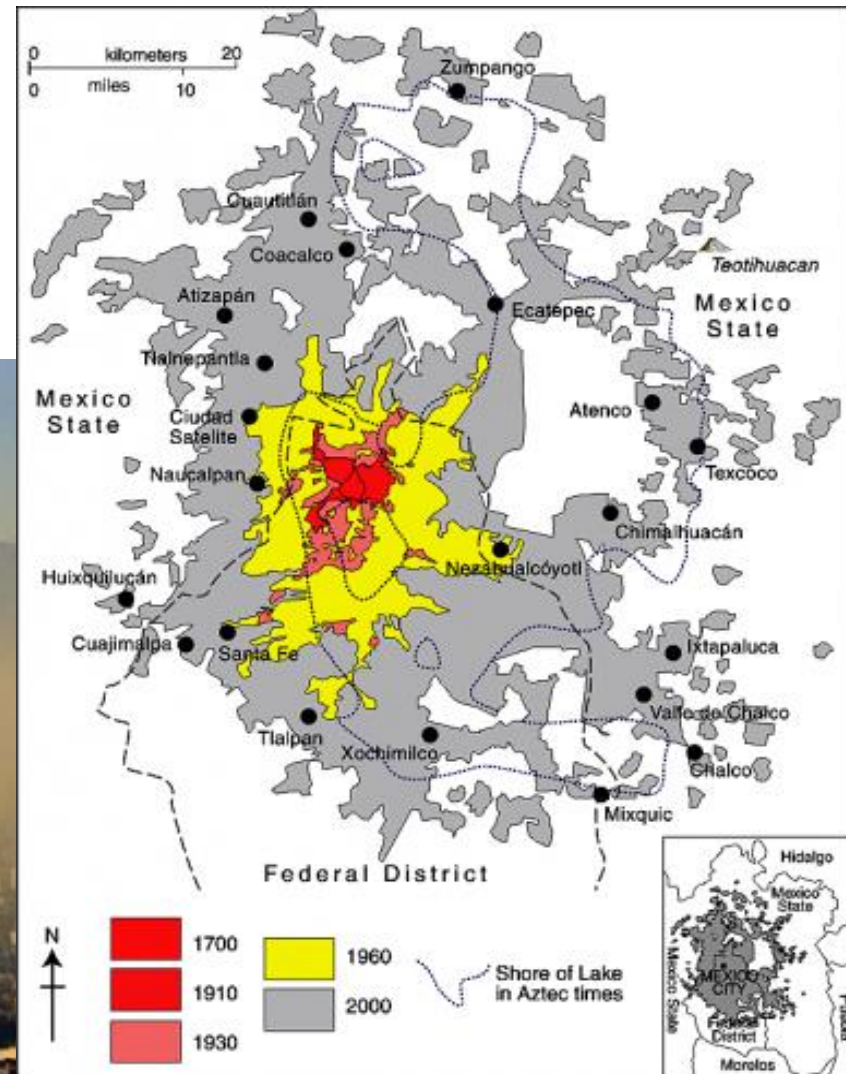
As well as the alerts issued by the **Mexican Health System**.







## AIR QUALITY AND ULTRAVIOLET RADIATION



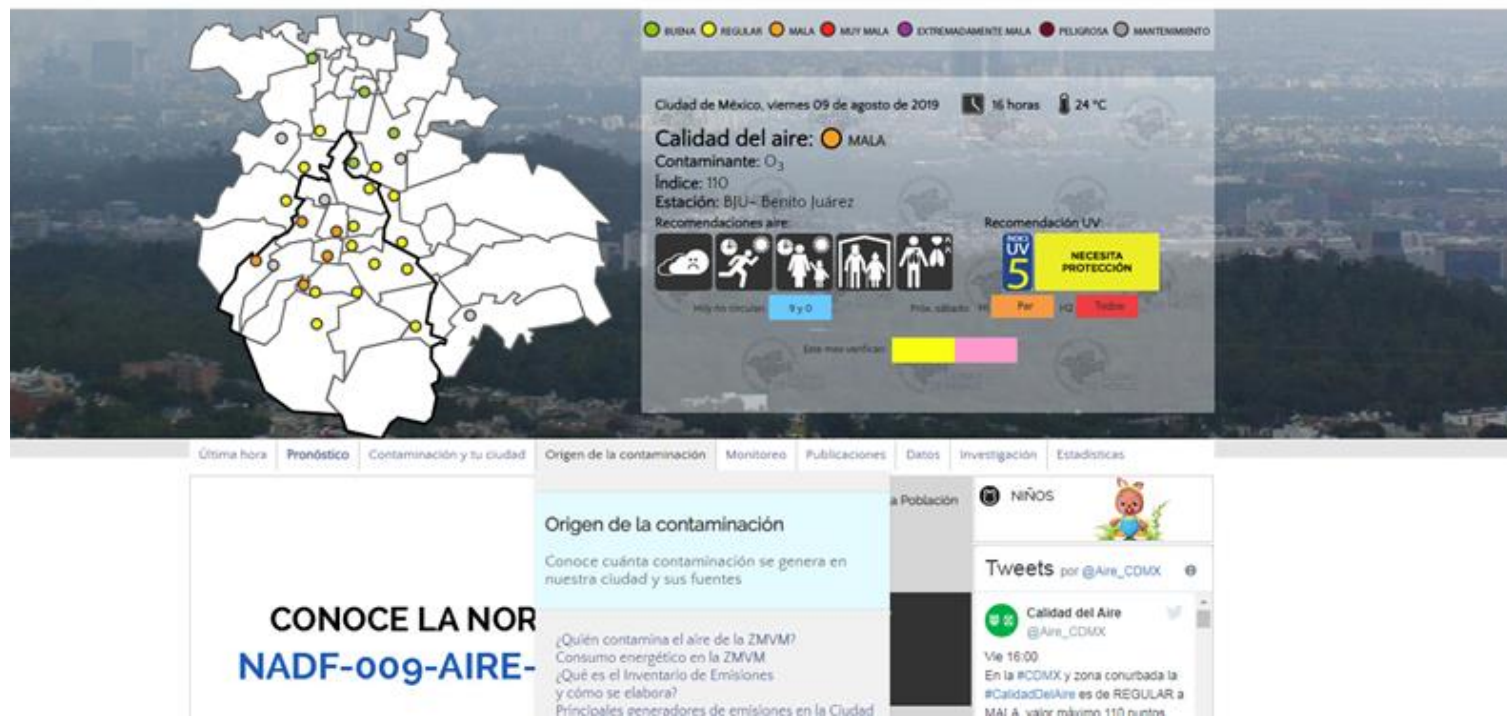
Spatial growth of Mexico City Metropolitan Area (Geo-Mexico  
Fig 22.2; all rights reserved)





## AIR QUALITY MONITORING AND THE ULTRAVIOLET RADIATION INDEX

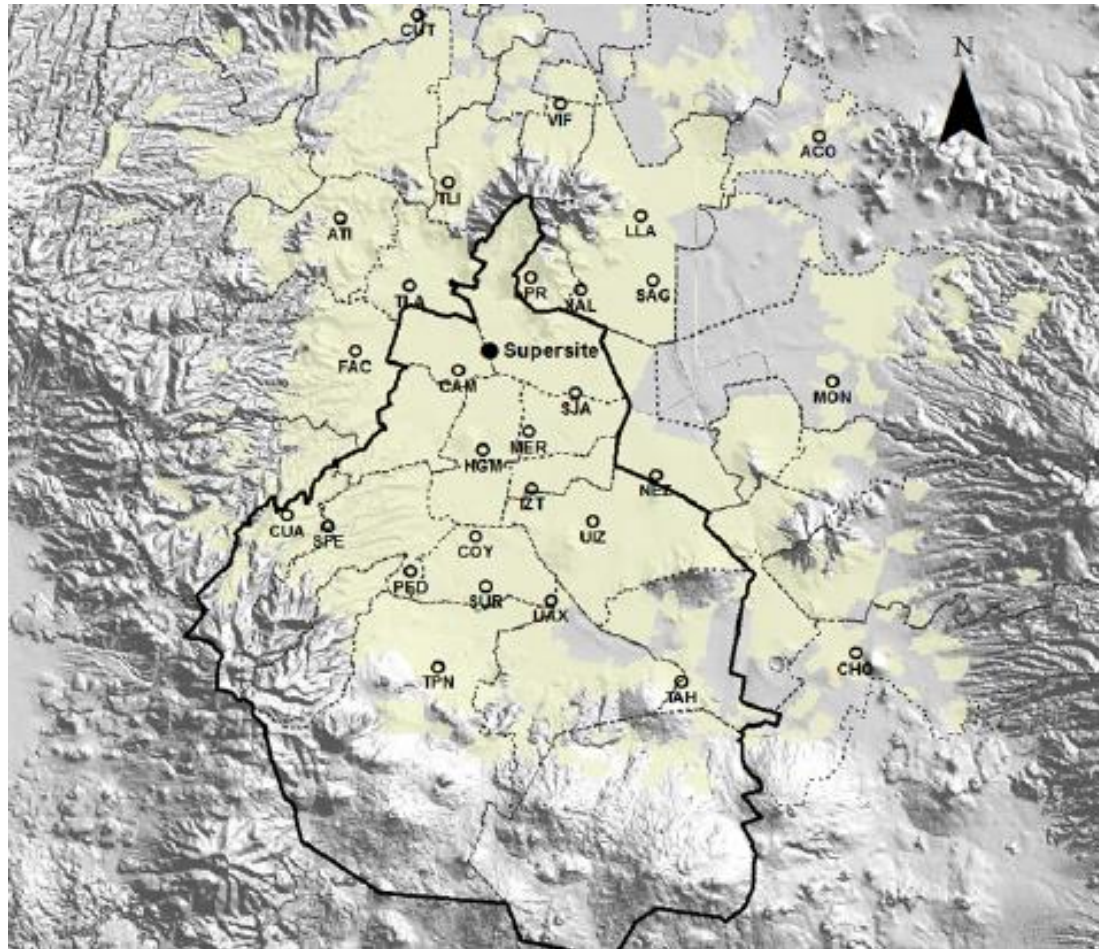
Implemented by the Secretariat of Environment of the Government of Mexico City, serves to report on the deterioration of air quality and exposure to solar radiation, which has negative effects on health and the environment.





## AIR QUALITY MONITORING AND THE ULTRAVIOLET RADIATION INDEX

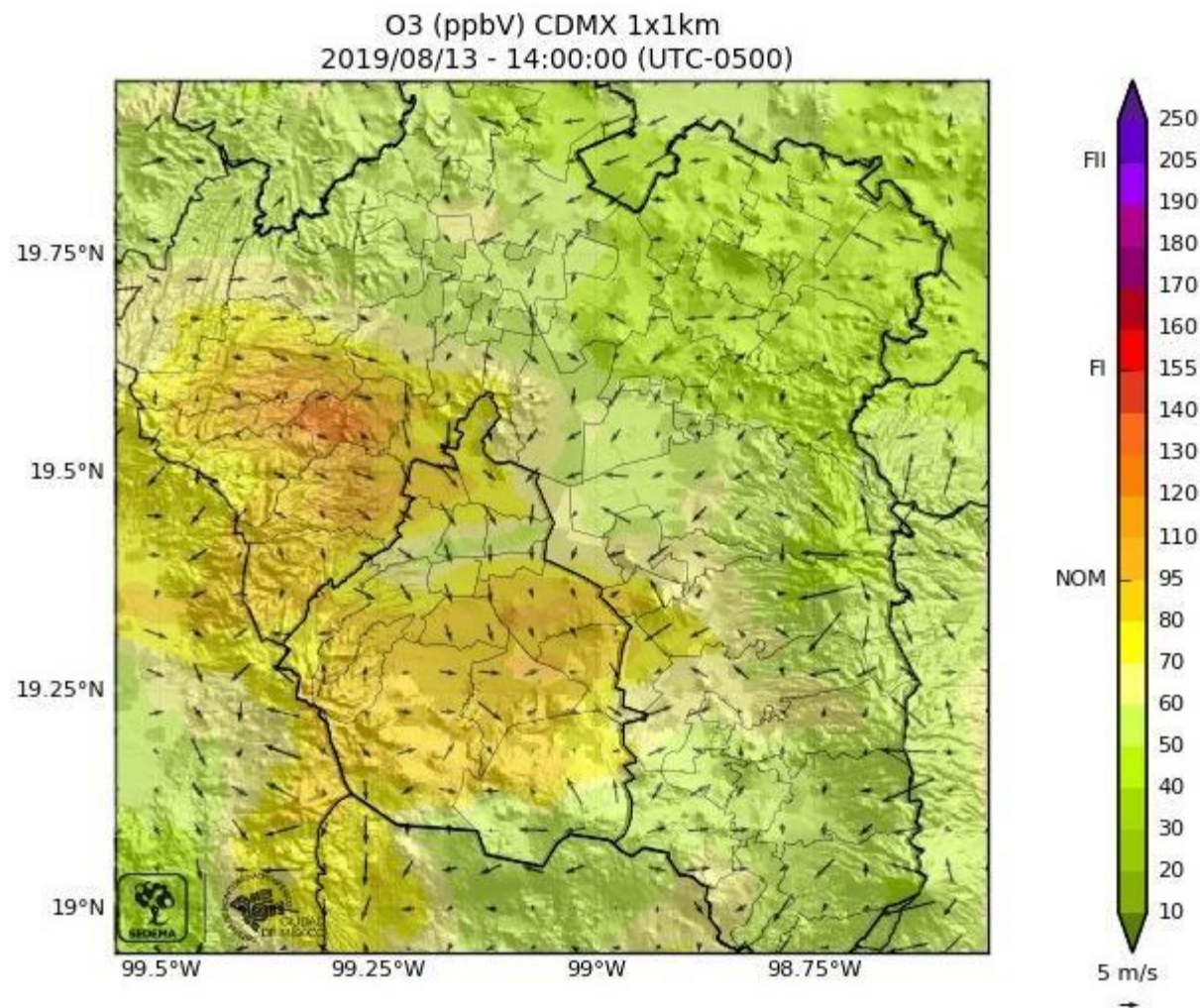
The Secretary of the Environment (SEDEMA) have 45 air quality monitoring stations that make up the Atmospheric Monitoring System, located in the CDMX and EDOMEX.







## FORECAST OF THE SPATIAL DISTRIBUTION OF OZONE CONCENTRATIONS

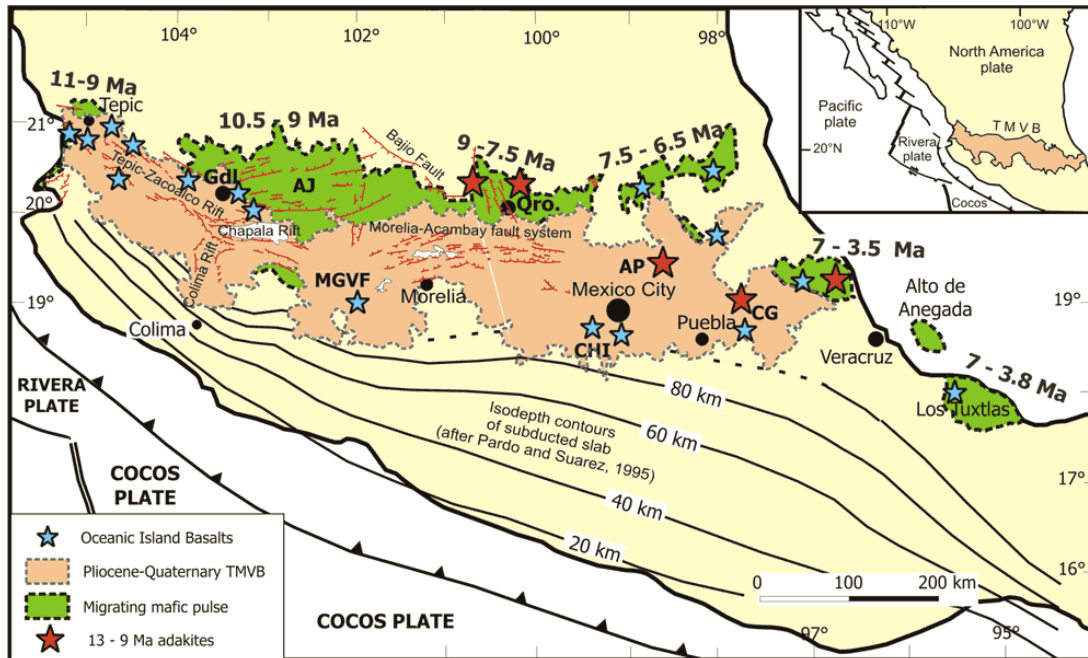






## TRANS-MEXICAN VOLCANIC BELT (TMVB)

Is a 1000 km long Neogene continental arc showing a large variation in composition and volcanic style, and an intra-arc extensional tectonics.





## VOLCANO TRAFFIC LIGHT ALERT SYSTEM

**Popocatepetl volcano** is monitored 24 hours a day by the National Center for Disaster Prevention. Through the volcanic traffic light, the population of Mexico City is informed about the state it keeps.







## SEVERE WEATHER

CGSMN GOES 13 IR4 ( 17:45 Z ) 20/Abr/2017

CONAGUA







## SEVERE WEATHER EARLY ALERT

The Severe Weather Early Alert aims to inform the population about the presence of heavy rains, wind, hail, snowfall or snow water, as well as high or low temperatures, this weather alert has a colored traffic light to indicate the magnitude and estimated time of the onset of the phenomenon so that the population can take self-protection actions.





## SEVERE WEATHER EARLY WARNING

| <i>Riesgo</i>   | <i>Criterios de clasificación</i>   |  |  |  |  |  |
|-----------------|---|--|--|--|--|--|
| <b>Verde</b>    | Condiciones promedio en la CDMX   |  |  |  |  |  |
| <b>Amarillo</b> | Presencia de hidrometeoros ligeros que ocasionan daños si se asocian a otras circunstancias |  |  |  |  |  |
| <b>Naranja</b>  | Fenómenos meteorológicos cuya intensidad puede producir daños en estructuras frágiles       |  |  |  |  |  |
| <b>Rojo</b>     | Fenómenos meteorológicos cuya intensidad provoca daños                                      |  |  |  |  |  |
| <b>Púrpura</b>  | Fenómenos meteorológicos con intensidad pocas veces registrada, que ocasiona daños graves   |  |  |  |  |  |



## SEVERE WEATHER EARLY WARNING

It is divided into 5 levels according to the risk intensity. includes rains, winds, hail drop, snowfall, high and low temperatures.

### CLASIFICACIÓN DE LOS NIVELES DE ALERTA POR FENÓMENOS METEOROLÓGICOS

|                        |                                  |                                |                                 |                                  |                                    |                                |
|------------------------|----------------------------------|--------------------------------|---------------------------------|----------------------------------|------------------------------------|--------------------------------|
| Alerta <b>Verde</b>    | <b>Lluvia</b><br><10<br>mm/24h   | <b>Viento</b><br><29<br>km/h   | <b>Granizo</b><br>Sin presencia | <b>Onda de calor</b><br><25° C   | <b>Onda Gélida</b><br>>8° C        | <b>Nevada</b><br>Sin presencia |
| Alerta <b>Amarilla</b> | <b>Lluvia</b><br>10-29<br>mm/24h | <b>Viento</b><br>30-49<br>km/h | <b>Granizo</b><br>Pequeño       | <b>Onda de calor</b><br>25-27° C | <b>Onda Gélida</b><br>4-8° C       | <b>Nevada</b><br>Aguanieve     |
| Alerta <b>Naranja</b>  | <b>Lluvia</b><br>30-49<br>mm/24h | <b>Viento</b><br>50-59<br>km/h | <b>Granizo</b><br>Mediano       | <b>Onda de calor</b><br>28-30° C | <b>Onda Gélida</b><br>0-3° C       | <b>Nevada</b><br>Ligera        |
| Alerta <b>Roja</b>     | <b>Lluvia</b><br>50-70<br>mm/24h | <b>Viento</b><br>60-69<br>km/h | <b>Granizo</b><br>Grande        | <b>Onda de calor</b><br>31-33° C | <b>Onda Gélida</b><br>(-4)-(-1)° C | <b>Nevada</b><br>Nevada        |
| Alerta <b>Púrpura</b>  | <b>Lluvia</b><br>>70<br>mm/24h   | <b>Viento</b><br>>70<br>km/h   | <b>Granizo</b><br>Muy grande    | <b>Onda de calor</b><br>>33° C   | <b>Onda Gélida</b><br>< (-4)° C    | <b>Nevada</b><br>Abundante     |





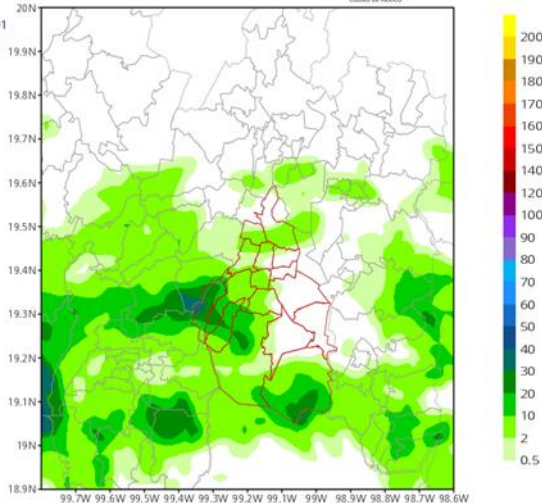
## MEXICO CITY RISK ATLAS

The highest and lowest risk areas are assessed according to the **Mexico City Risk Atlas**.

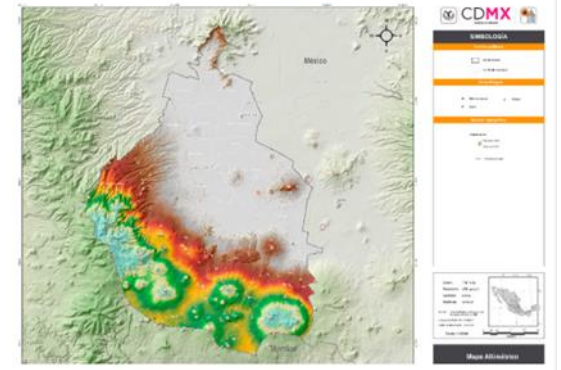
Data on temperature, wind direction and speed, humidity, as well as meteorological satellite images and radars for rain detection are collected.

PRONOSTICO DE LLUVIA en 24 hrs.

valido:20190801  
WRF/SGIRPC  
Meteorología



Altimétrico



physical-mathematical equations are solved using computational models to obtain short-term forecasts.





## MECHANISMS FOR DISSEMINATION AND DISSEMINATION OF ALERTS

Currently, the alerts are disseminated to the population through newsletters, media, social networks, through the loudspeakers of the C5 cameras, and through screens in public transport.







Screens located in the main roads of Mexico City, belonging to the Secretariat of Works and Services of CDMX.





There is dissemination and coordination through social networks like WhatsApp and e-mail groups with authorities of the central governments and the 16 municipalities, which allow to establish coordinated protocols of action, as well as surveillance and attention 24 hours a day.

