

MÉXICO

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GOBIERNO DE LA REPÚBLICA





COORDINACIÓN NACIONAL DE  
PROTECCIÓN CIVIL  

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**MÉXICO**

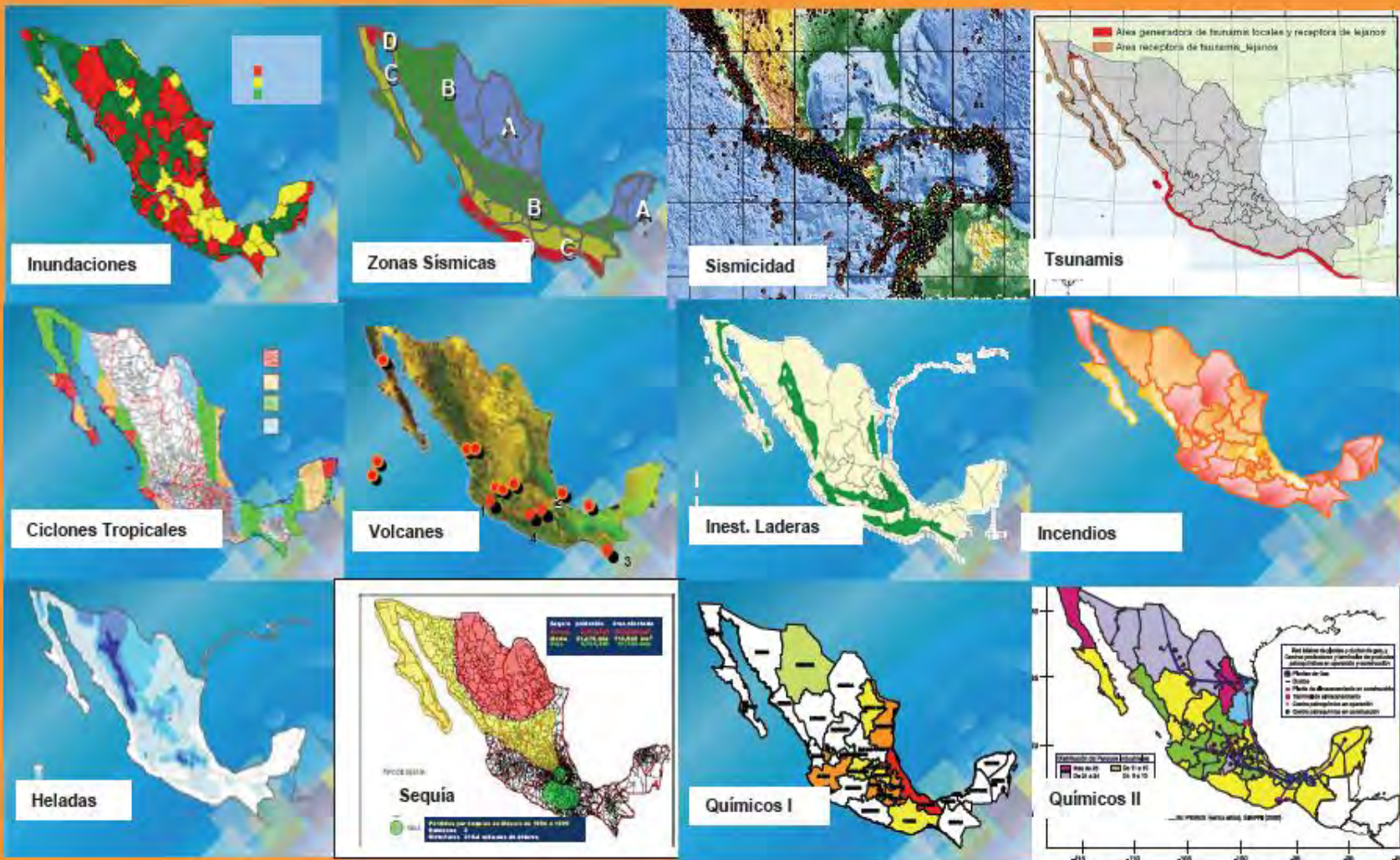
## **Building Resilience after Earthquake in Mexico City.**

**Santiago, Chile  
August 2018**

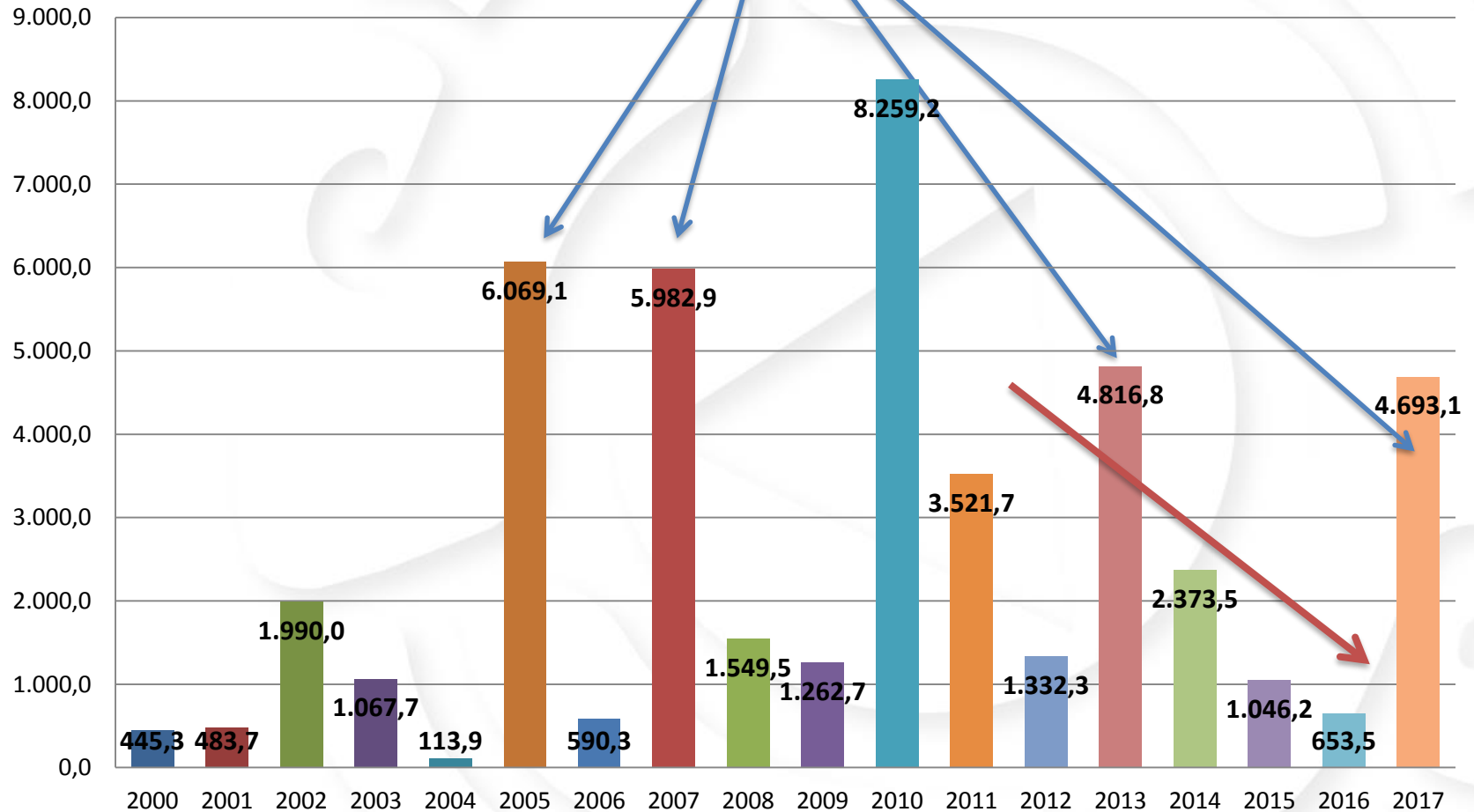
CENAPRED is a **techno-scientific institution** that depends of the National Civil Protection Coordination (FEMA equivalent), **that is responsible for the creation of public policy matters related to disaster prevention, and risk reduction**, based on research, monitoring, training and knowledge diffusion.

- National Risk Atlas
- National School of Civil Protection
- National Alert System
- Monitoring

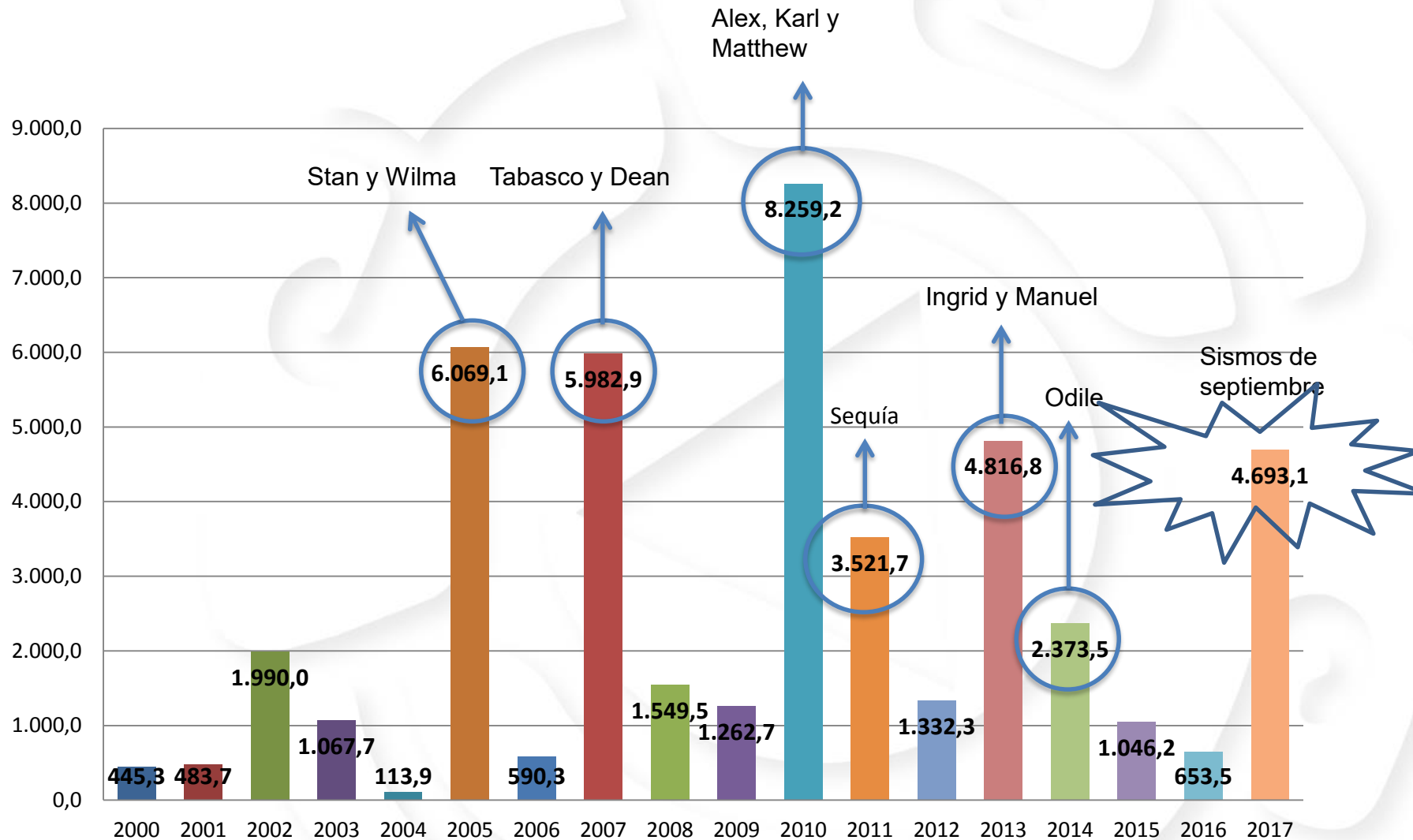




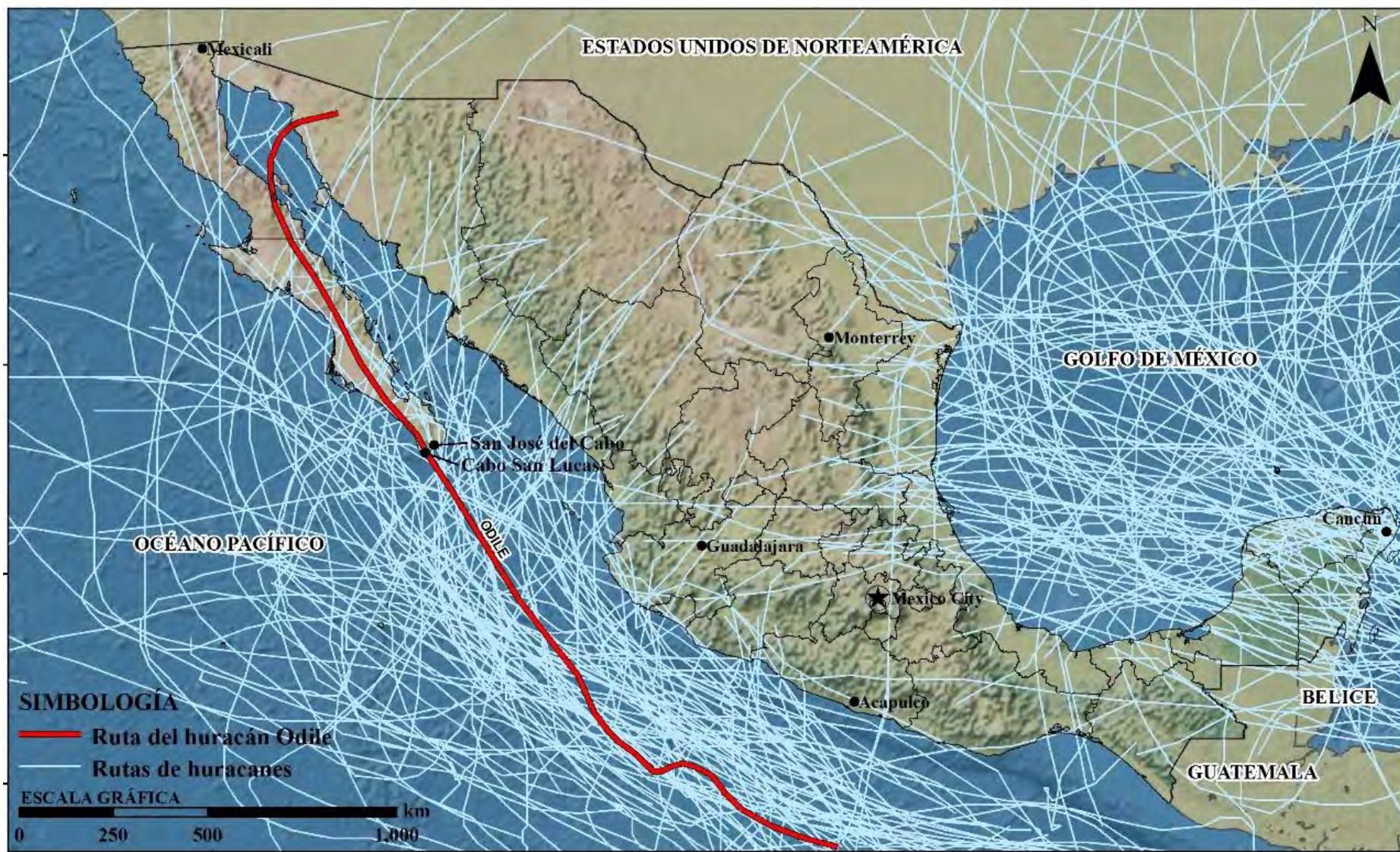
¿What  
happened?



Economic Losses due to Natural Disasters in Mexico 2000-2017 (dollars million)

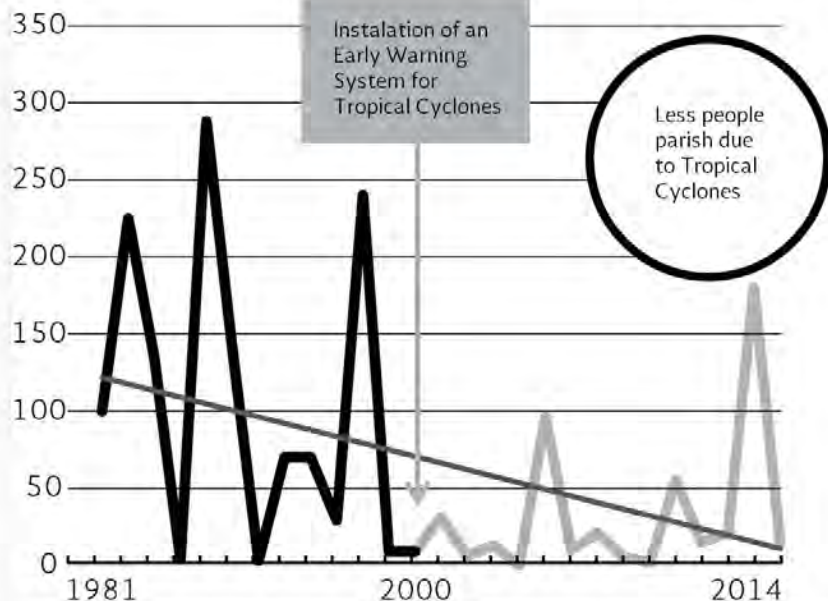


Economic Losses due to Natural Disasters in Mexico 2000-2017 (dollars million)



# Early Warning System for Tropical Cyclones

**Tropical Cylones 1981-2014**  
(deaths)



## EARLY WARNING SYSTEMS

Actions that could save lives

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.

### 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.



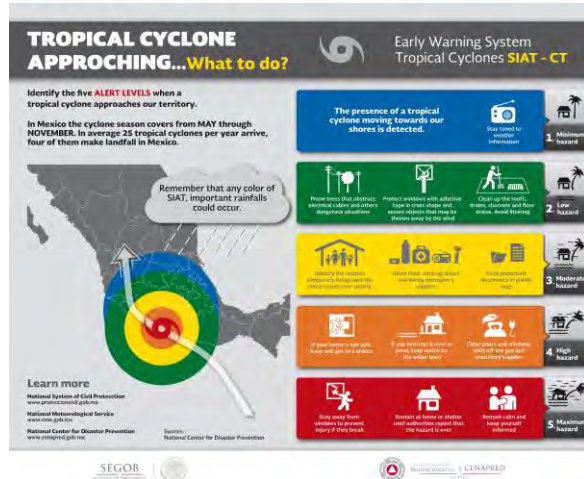
### Learn more

National System of Civil Protection  
[www.proteccioncivil.gob.mx](http://www.proteccioncivil.gob.mx)  
National Center for Disaster Prevention  
[www.cenapred.gob.mx](http://www.cenapred.gob.mx)  
Source: National Center for Disaster Prevention

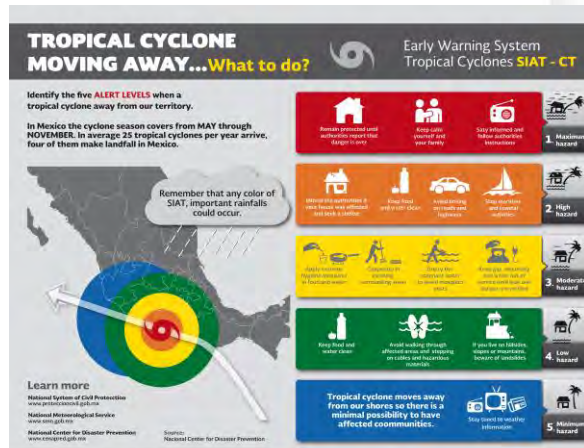
A successful early warning system requires the coordinated participation of all sectors.

#PREVENIRESVIVIR

# Early Warning System for Tropical Cyclones



MOVING MEXICO INTO PREVENTION



MOVING MEXICO INTO PREVENTION

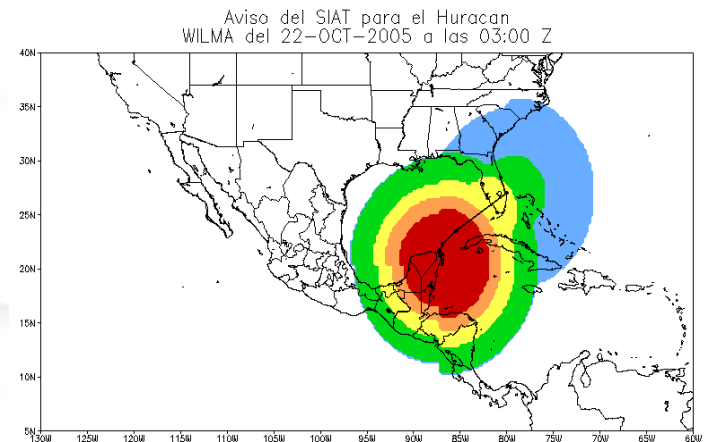
## Approaching Table / Front of the cyclone

| Promedio de Escalas | detección o más de 72 | 72 a 60 horas | 60 a 48 horas | 48 a 36 horas | 36 a 24 horas | 24 a 18 horas | 18 a 12 horas | 12 a 6 horas | menos de 6 horas |
|---------------------|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|------------------|
| 0 a 0.99            |                       |               |               |               |               |               |               |              |                  |
| 1 a 1.99            |                       |               |               |               |               |               |               |              |                  |
| 2 a 2.99            |                       |               |               |               |               |               |               |              |                  |
| 3 a 3.99            |                       |               |               |               |               |               |               |              |                  |
| 4 a 4.99            |                       |               |               |               |               |               |               |              |                  |
| 5                   |                       |               |               |               |               |               |               |              |                  |

## Moving away Table / Back of the cyclone

| Promedio de Escalas | 0 a 100 km | 100 a 150 km | 150 a 200 km | 200 a 250 km | 250 a 300 km | 300 a 350 km | 350 a 400 km | 400 a 500 km | 500 a 750 km | mayor a 750 km |
|---------------------|------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|
| 0 a 0.99            |            |              |              |              |              |              |              |              |              |                |
| 1 a 1.99            |            |              |              |              |              |              |              |              |              |                |
| 2 a 2.99            |            |              |              |              |              |              |              |              |              |                |
| 3 a 3.99            |            |              |              |              |              |              |              |              |              |                |
| 4 a 4.99            |            |              |              |              |              |              |              |              |              |                |
| 5                   |            |              |              |              |              |              |              |              |              |                |

## Wilma Warnings, October 2005

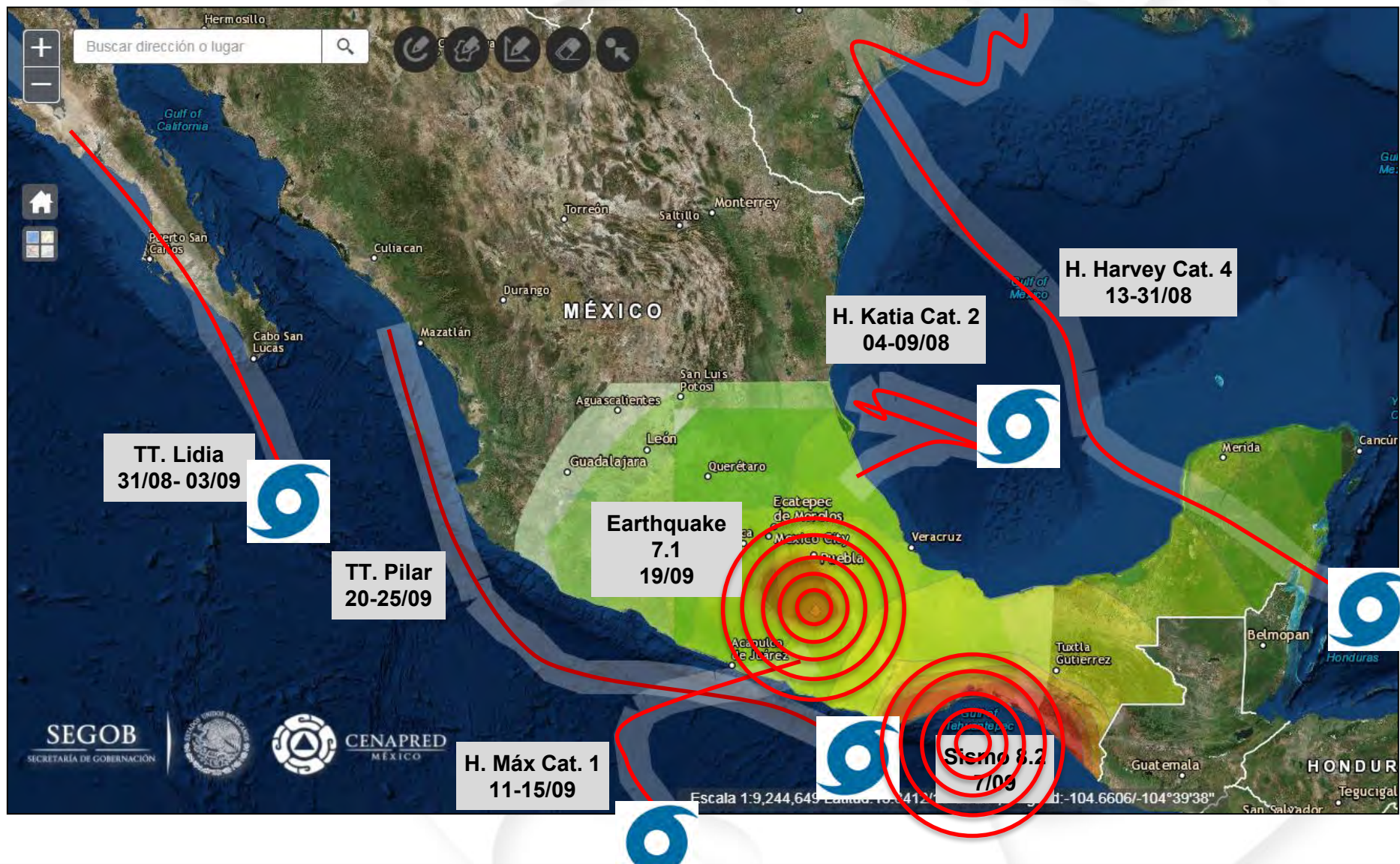


## Impactos del Sismo del 19 de septiembre de 1985



- Earthquake was felt by por 20 million people.
- 6 thousand deceased buy another source more than 10 thousand
- 20 thousand injured
- 36 thousand complete destroy ando and another 65 thousand with another damage kind.
- 500 building complete destroyed
- It is the disaster with the greatest economic and social repercussions in history.

**August –September: 2 earthquakes, 8.2 y 7.1; 2 Tropical Storm; and 3 Hurricanes.**

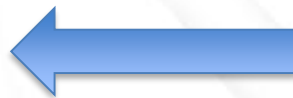


## National Emergency Committee



Conformed by all the  
dependencies of the  
Federal Public  
Administration

Command, Control  
Center Mexico City





## Receptores de alertamiento Sísmico Marca SARMEX



## ¿SABES EN QUÉ MEDIOS SE DIFUNDE LA ALERTA SÍSMICA MEXICANA?

SASPER



ALTOPARANTES CDMX



RADIO AM  
Y FM



Te invitamos a saber cuáles  
estaciones difunden la Alerta

TV



Oaxaca, Guerrero,  
Puebla, Chilpancingo y CDMX



SISTEMA  
MULTIALERTA  
SARMEX



**CDMX**  
CIUDAD DE MÉXICO



**SIMULACRO  
CDMX 2016**



El Sistema de Alerta Sísmica  
Mexicano SASMEX® dará inicio al  
simulacro el lunes 19 de septiembre  
a las

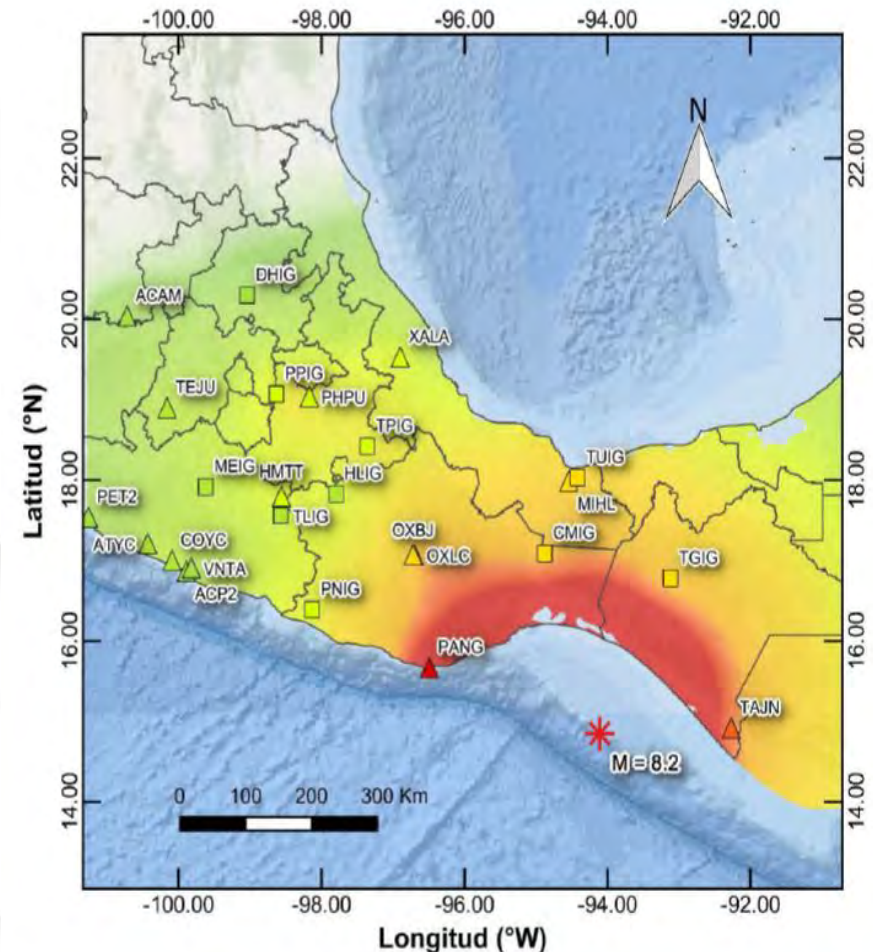
**11:00 hrs.**

Será escuchada a través de los altavoces que se encuentran en las  
cámaras de seguridad del Centro de Control y Monitoreo  
capitalino (C4) ubicados en varios puntos de la Ciudad de México



## September Earthquake 7 : 8.2

- Affected States: Chiapas y Oaxaca.
- Deaths: 99 personas
  - 79 in Oaxaca
  - 16 in Chiapas
  - 4 in Tabasco
- The earthquake was considered the most powerful in 100 years



| PGA (cm/s <sup>2</sup> )  | <1   | 2 | 4 | 11       | 30 | 90 | 110    | 130 | >150 |
|---------------------------|------|---|---|----------|----|----|--------|-----|------|
| Percepción del movimiento | Leve |   |   | Moderado |    |    | Fuerte |     |      |

Fuente: Unidad de Instrumentación Sísmica y Coordinación de Ingeniería Sísmológica. UNAM

Monitor Sasmex



Play

07/11/2017 20:49:54

00:01

42211 Huamelula SP

Image Data SIO, NOAA, U.S. Navy, NGA, GEBCO ©2012 Google ©2012 INEGI ©2012 CIRES

Latitud 14.74 Longitud -99.20 M4.0 08 nov 2017 16:09:27 74 Latitud 16.21 Longitud -105.11 Cayetano

Distancia 1290.4 km

Ssn

Últimos Eventos  
08/11/17 23:05:36 42234 Lach

Últimas transmisiones  
09/11/17 09:19:52 42233 Cor

os mensajes administr

Tiempo de Arribo S

ES

09:20 a.m.

09/11/2017

## Sismo del 19 de Septiembre: 7.1

- Epicenter 120 km Depth 57 km
- The earthquake was felt by 40 million people..
- Affected States: Ciudad de México, Morelos, Puebla Estado de México Guerrero, Oaxaca
- Deaths: 369 personas
  - **228 Mexico City**
  - 74 Morelos
  - 45 Puebla
  - 15 Estado de México
  - 6 Guerrero
  - 1 Oaxaca
- 228 deaths in Mexico City
- **90 mens,**
- **138 women,**
- **29 minor children**

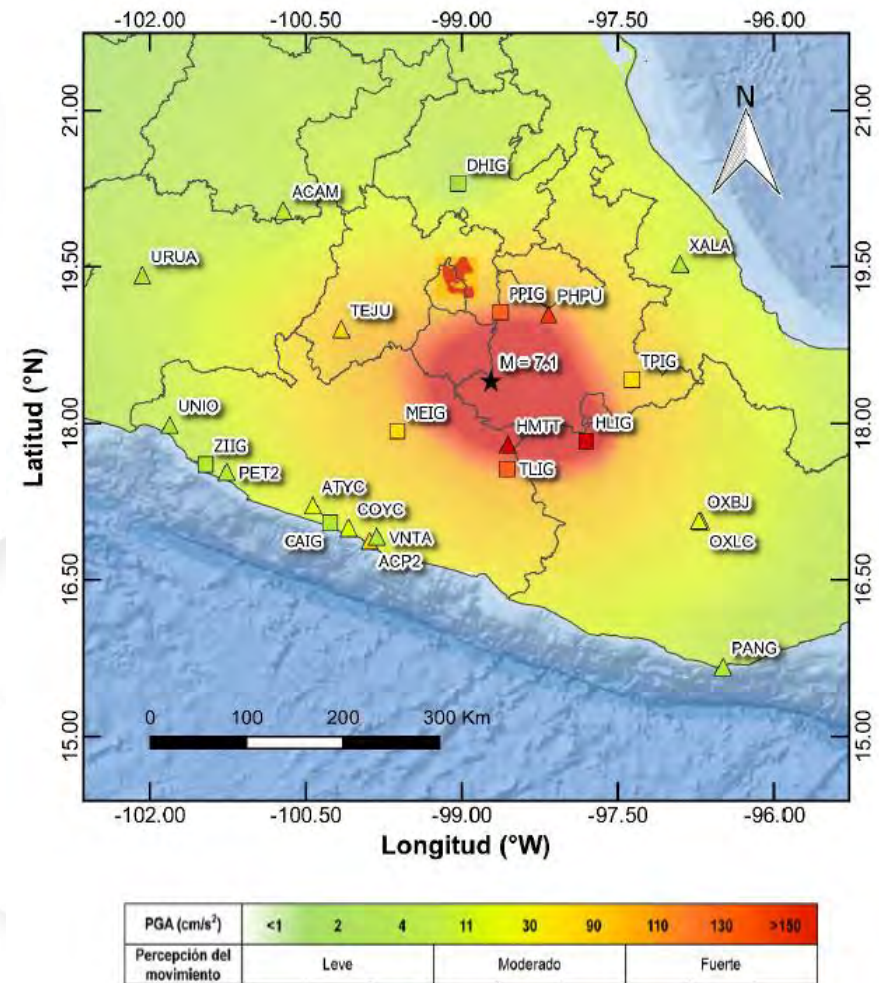
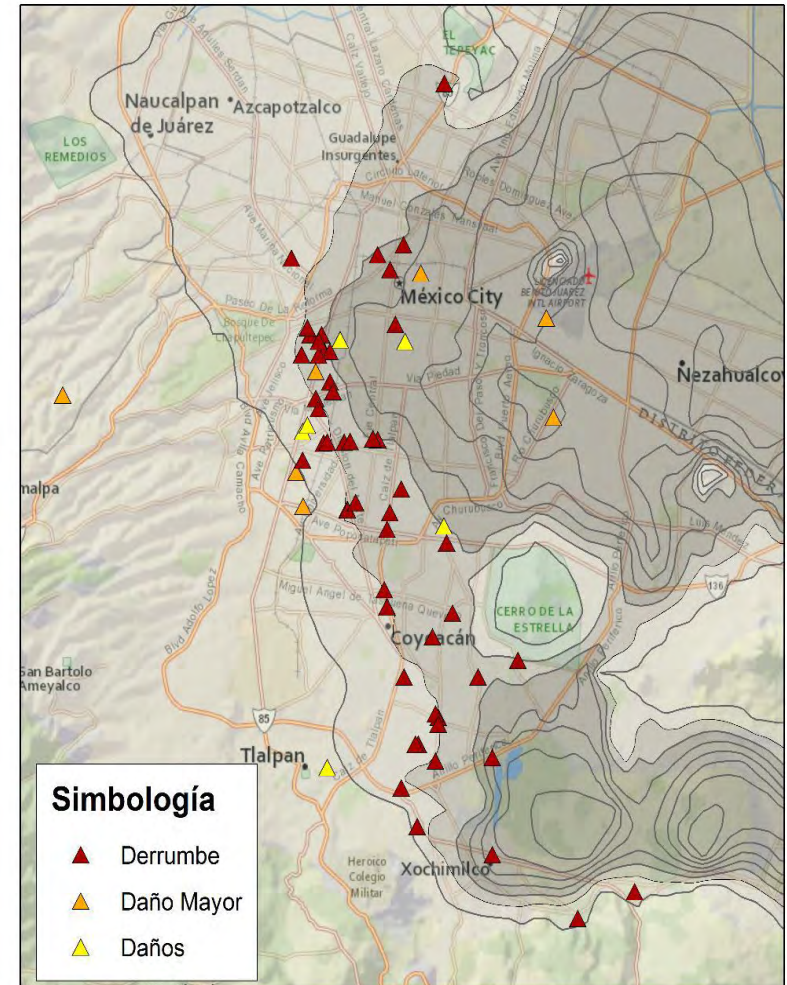


Figura 2. Mapa de Intensidad de la Aceleración Máxima del Suelo (PGA).

## Effects in Mexico City

- 38 buildings were collapsed in the earthquake moment.
- 14 812 buildings was affected.
- 143 hospitals with some kind damages
- 586 schools with damage. Only one collapsed: Rebsamen School (Private)



# Mexico City Subway





Mexico  
City

# Colegio Enrique Rébsamen



Antes



Después













EL ARTE  
DEL  
BUEN GUSTO  
DEL 1 AL 31 DE MARZO DEL 2016

CENTRO DE ENTRETENIMIENTO  
MATERA  
\$8,900

muebles  
dettaglio









Fecha de Actualización 01 de junio de 2017



gob.mx

Trámites

Gobierno

Participa

Datos



ATLAS NACIONAL DE RIESGOS

Inicio

Aplicaciones

Atlas Estatales y Municipales

Descargas

Búsqueda de Metadatos



Servicio Meteorológico  
Nacional (SMN)

Químicos-Tecnológicos

Socio-Organizativos

Análisis

Área: 2382.03 km<sup>2</sup>  
Perímetro: 173.09 km

Población  
222,943

Población  
por  
Estado

| Masculino         | Femenino  |
|-------------------|-----------|
| 107,897           | 115,046   |
| Menores a 12 años |           |
| 53,356            |           |
| M: 27,118         | F: 26,238 |
| Mayores a 60 años |           |
| 15,518            |           |
| M: 7,051          | F: 8,467  |

Viviendas  
71,871

Establecimientos  
de Salud  
125

Escuelas  
961

Supermercados  
101

# Several applications were made in the Risk National Atlas in order to support to evaluation damage

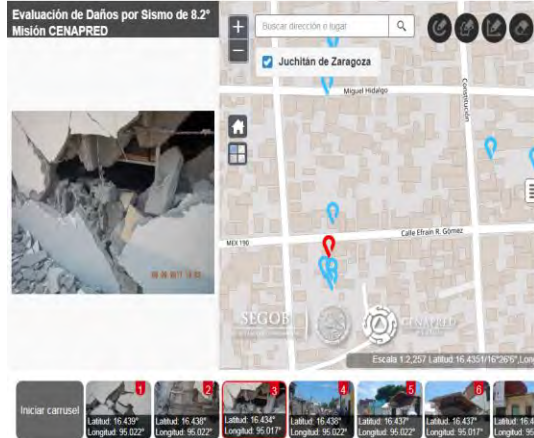
**SEGOB**  
SECRETARÍA DE GOBERNACIÓN



COORDINACIÓN NACIONAL DE  
PROTECCIÓN CIVIL

**CENAPRED**  
MÉXICO

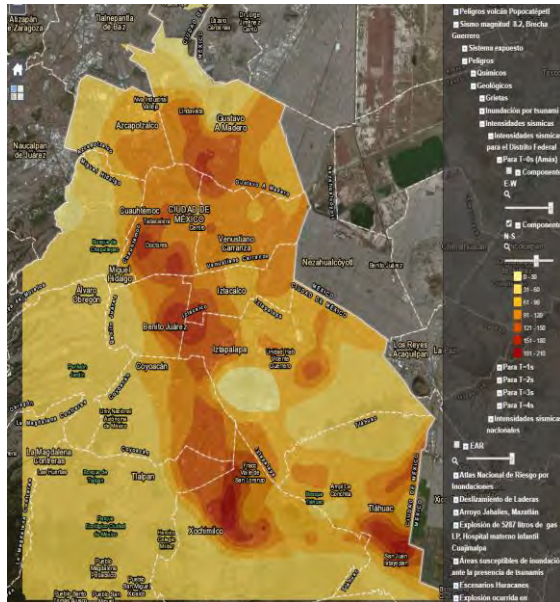
Evaluación de Daños por Sismo de 8.2° Juchitán de Zaragoza, Oaxaca



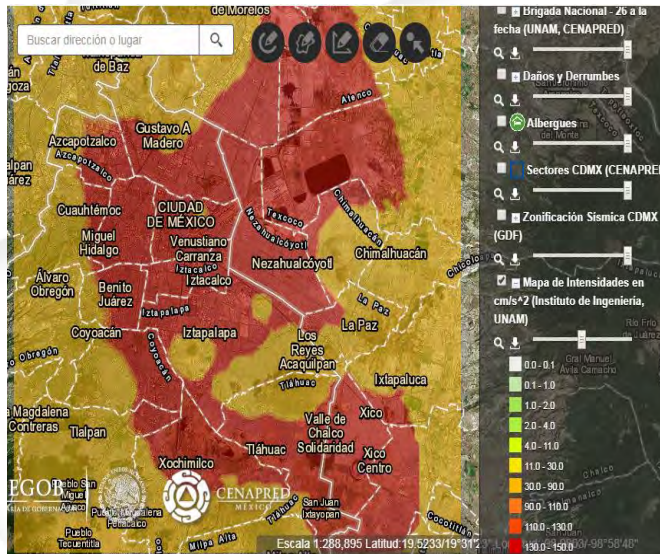
Evento Sismo 19/09/2017



Earthquake Chiapas 8.2, Chiapas 07-09-2017



Earthquake Scenario 8.2, (2010)



Earthquake 7.1, Morelos 19-09-2017



ob mx

Trámites

Gobierno

Participa

Datos

Ingresar Búsqueda



ATLAS NACIONAL DE RIESGOS

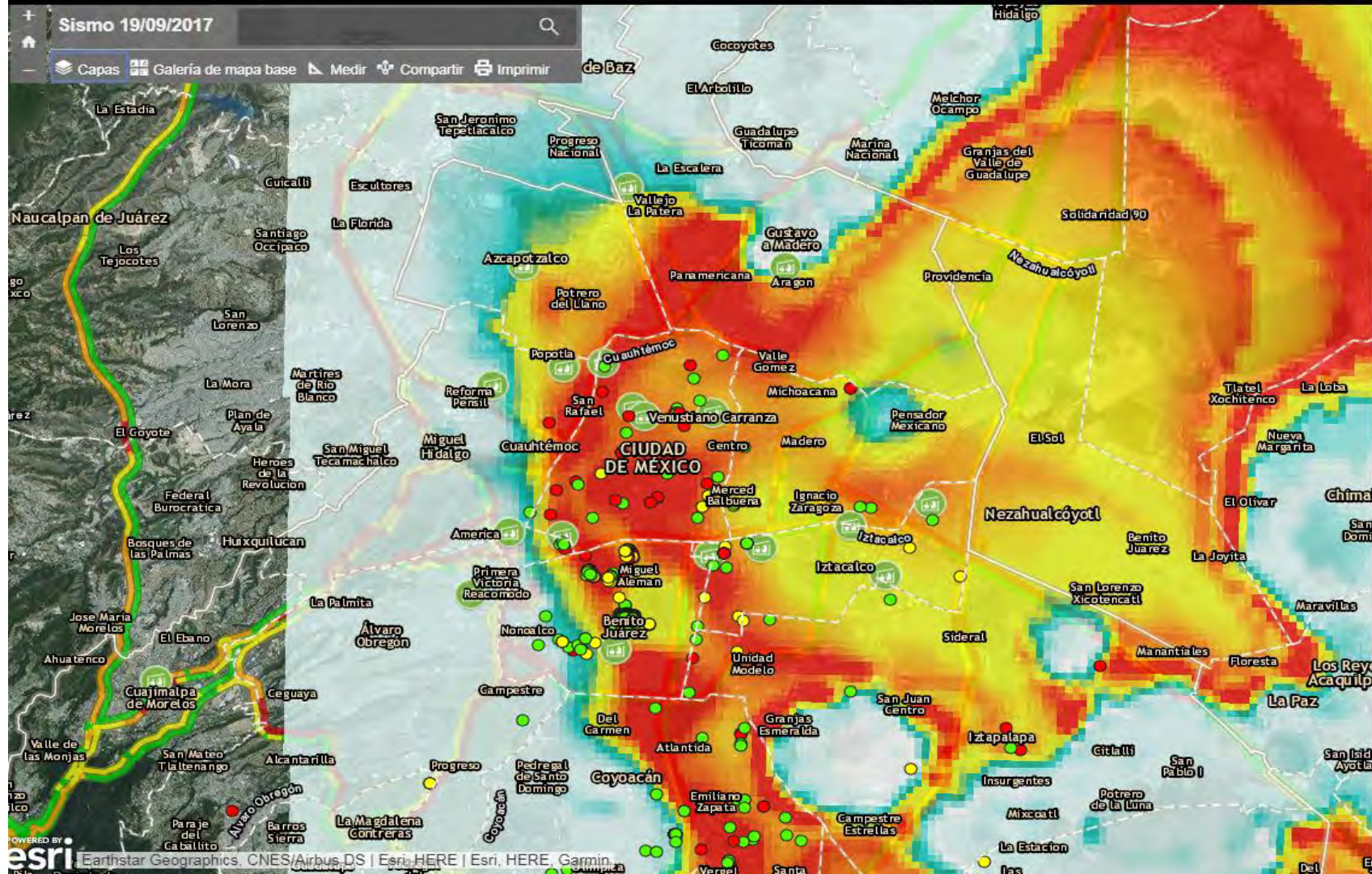
Inicio

Aplicaciones

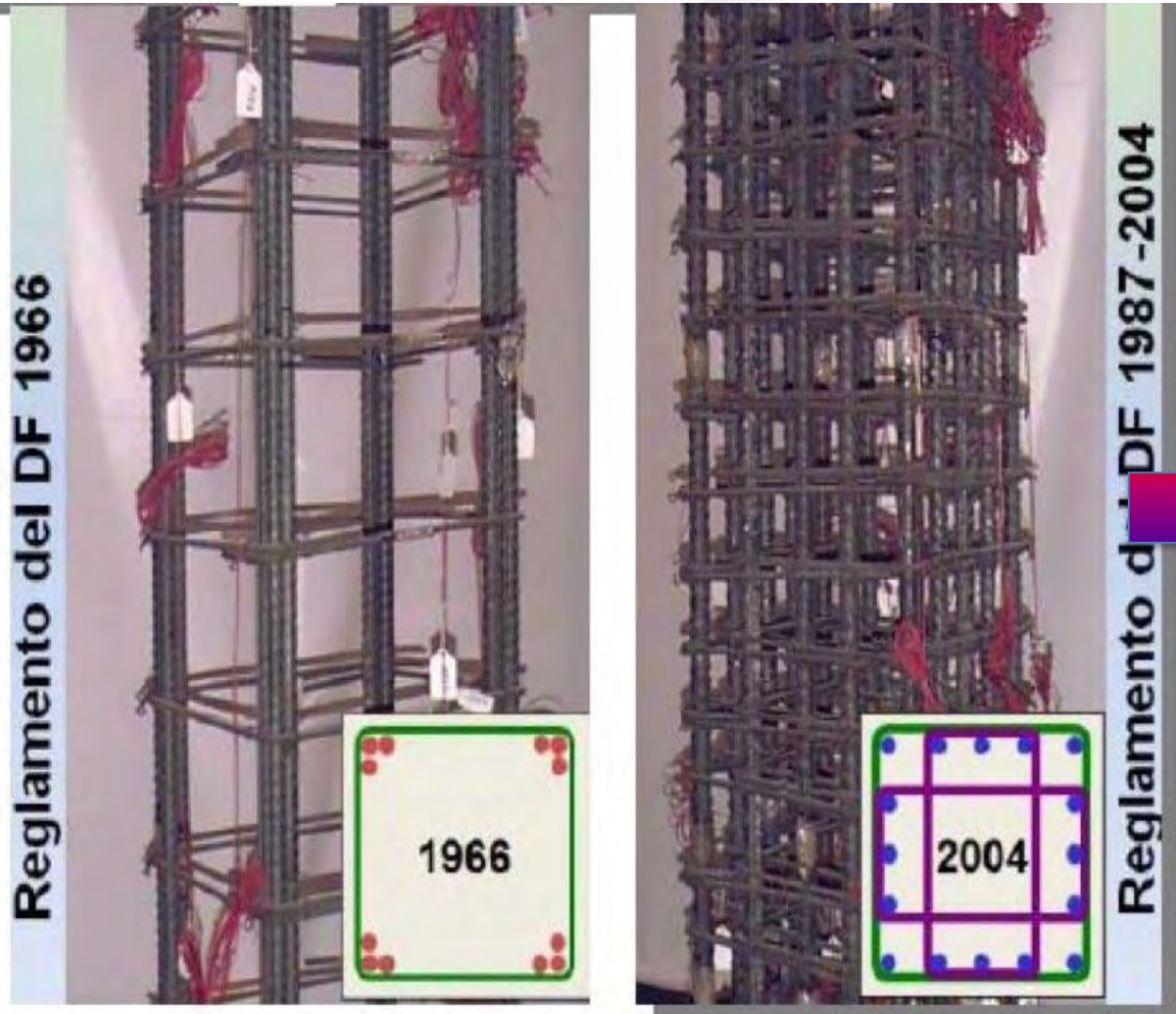
Atlas Estatales y Municipales

Descargas

Búsqueda de Metadatos



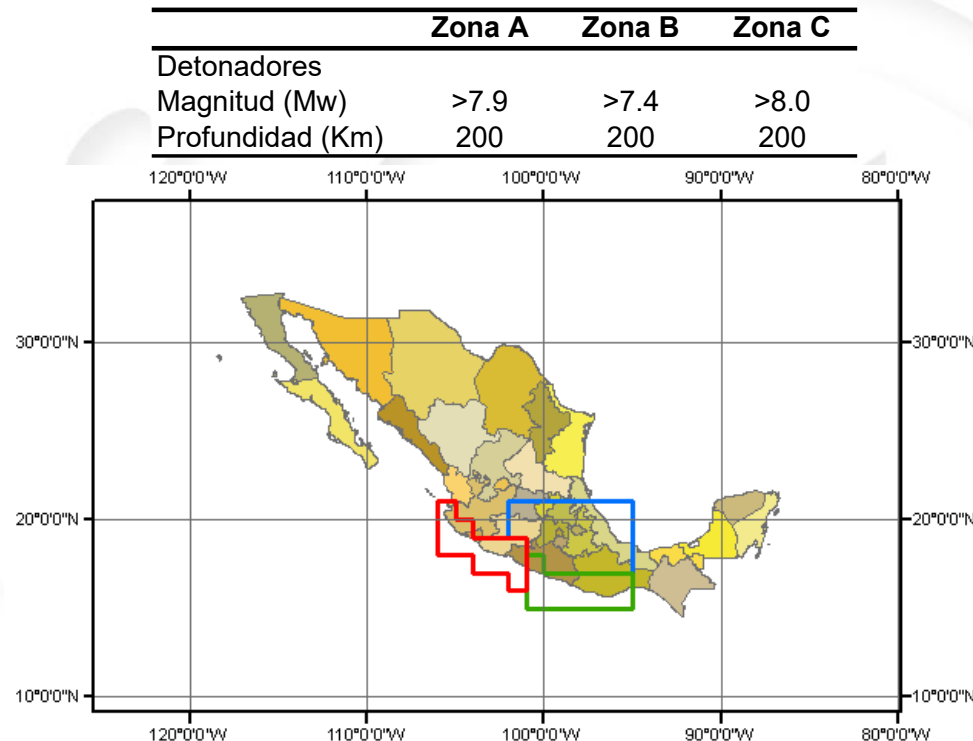
# Mexico City Building Code



Standards for Seismic  
Rehabilitation buildings  
damaged by the  
September 19  
Earthquake, 2017

# Multi Cat 2017

- Covering extended earthquake zones as well as hurricanes from two zones in the Pacific and one in the Atlantic. .



Covering extended earthquake zones as well as hurricanes from two zones in the Pacific and one in the Atlantic. Specific indexes on the pressure of the tropical storm and the magnitude, depth and location of the earthquakes can trigger a payment of the coverage up to USD 315 million, with USD 140 million for earthquakes, USD 100 million for Pacific coast hurricanes and USD 75 million for Atlantic hurricanes

- Operate **the National Alert System**. It will allow us to have information in real time to improve the safety of the population in case of imminent risk.



Other phenomena:

Fires  
Drought  
Tsunami

The integration of the monitoring and alert, existing systems, will allow us to transmit emergency messages to the public.

# DISTANCE COURSE (ONLINE): NATIONAL SCHOOL OF PROTECTION CIVIL (ENAPROC)

## Basic Technician in Risk Management

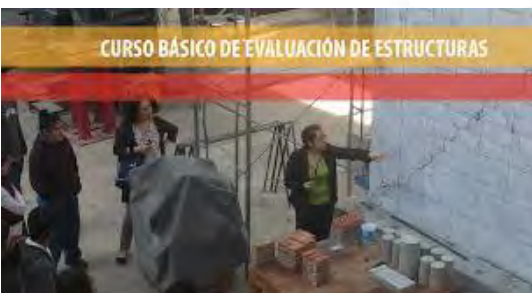
Alumnos Programa Técnico Básico en Gestión Integral del Riesgo



**Inscritos: 20,421**  
H= 13,441 M=5,831  
**Presencia Nacional:**  
1,039 municipios de  
2,457  
**Presencia en el  
extranjero:** 212 alumnos  
de 22 países  
**Egresados:** 3,520  
H= 2,598 M= 922  
Nacionales: 3,479  
Extranjeros: 41



## Basic Course Structure Evaluation



**Participantes:**  
**3,614**  
H= 2,383 M= 1,231  
**Nacionales:** 3,060  
**Extranjeros:** 554  
**Egresados:** 596  
H= 419 M=177  
**Nacionales:** 565  
**Extranjeros:** 31

## Risk prevention in your school



**Inicio:** 31 de julio  
**Término:** 30  
septiembre  
**Registrados a la  
fecha:** 11,181

## Promotion of culture in disaster prevention and civil protection

- Support campaigns through diversified media
- high-impact communication by using publishers, print and digital products as infographics.
- Posting of websites and extensive use of social networks
- Support for the implementation of technical, academic and outreach events



*schoolchildren contest of story-telling and painting*

# Our Vision POLICY MAKING

- **#Prevent to live**
- **Prevent to save money.**
- **Tools for Prevention:**
  - **National Risk Atlas**
  - **National School of Civil Protection**
  - **National Alert System**
  - **Disemination of Civil Protection Culture.**

Thank you!!!!



Santa María Xanadí, Oaxaca September 2017