



# CONAGUA

COMISIÓN NACIONAL DEL AGUA

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SUBDIRECCIÓN GENERAL TÉCNICA  
COORDINACIÓN GENERAL DEL SERVICIO METEOROLÓGICO NACIONAL

Meteorological Observational Networks,  
Needs and challenges

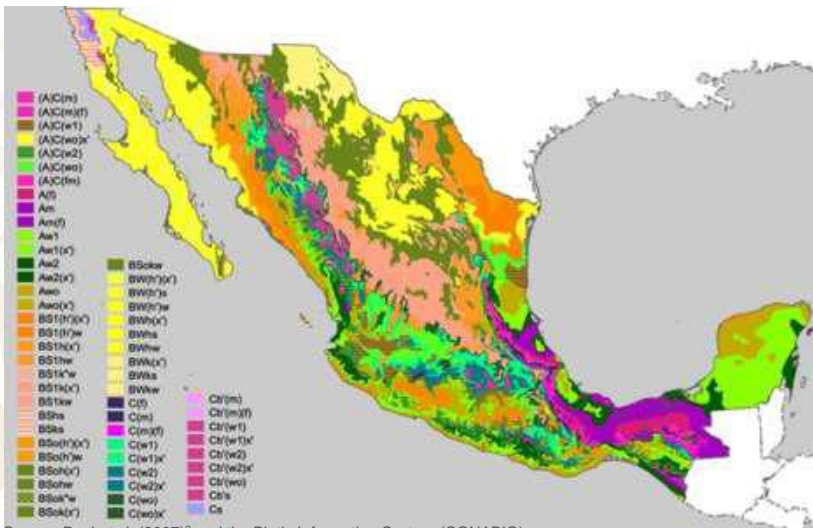
M.C. Fabián Vázquez Romana

Gerente de Redes de Observación y Telemática

Mexico City, September 25, 2019

The **extension, geographical location, and topography** of Mexico are some of the causes of a great variety of climates;

## Climate Diversity of Mexico



Source: Peel et al. (2007)<sup>2</sup> and the Biotic Information System (CONABIO).

*Category 4 y 5 (Saffir-Simpson) Hurricane tracks.*



Source: NOAA data and NWS of Mexico.

The Installation of observational points, such as the observational networks of *automatic weather stations, meteorological observatories, weather radars, satellite reception stations and radiosoundings*, allow us to have a better understanding of the current atmospheric conditions in order to predict its future behavior.

Therefore, the **importance of having** a wide observational network, which captures the variety of **hydrometeorological phenomena**, is to support one of the **main functions of the National Meteorological Service of Mexico –SMN.**

**Functions:**

- **Monitoring and processing meteorological and climatological data.**
- **Weather Forecasting (short, medium and long range).**
- **Issuing meteorological and climatological watches and warnings.**
- **Organize and distribute national climate information.**



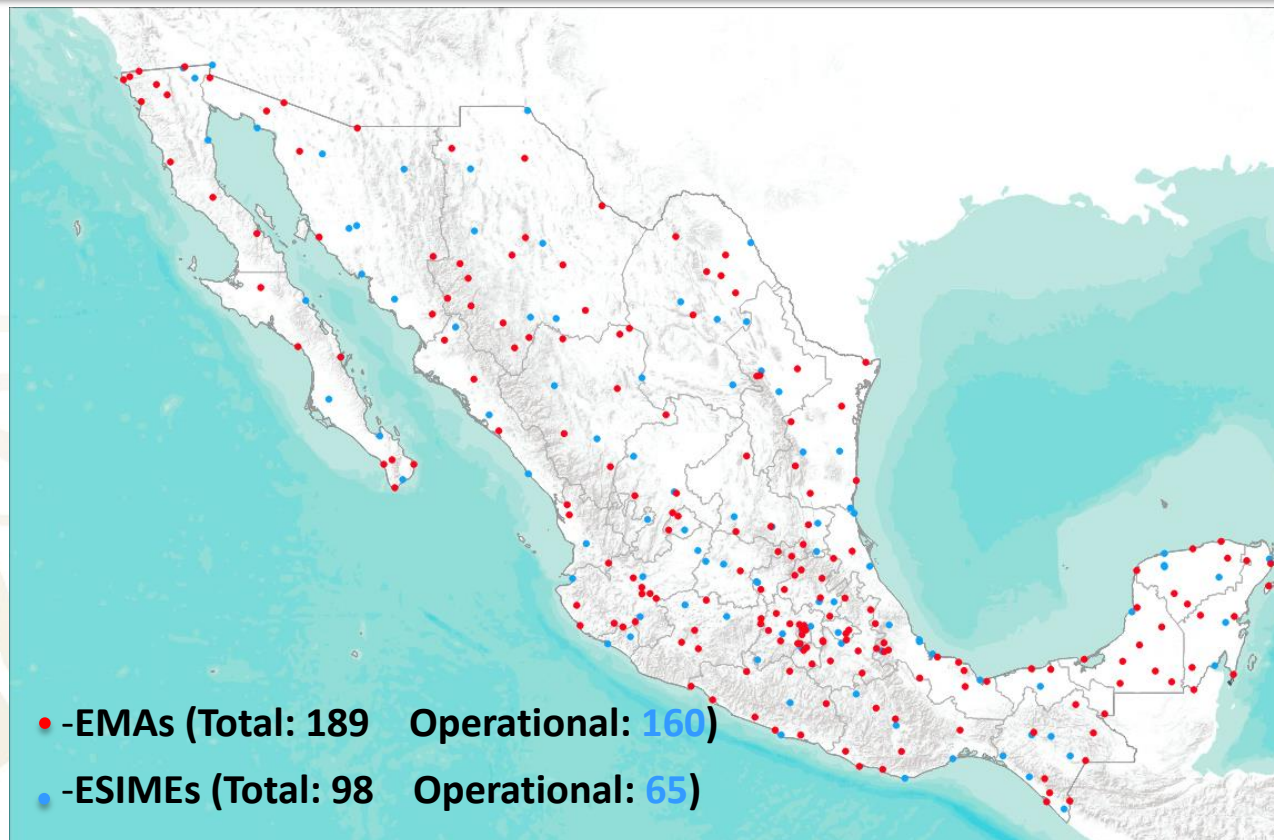
### Internal NWSM

- Forecasting Center
- Numerical Models
- Climatology
- CONAGUA's regional and local offices

### External

(Government agencies, universities, private sector, general public)

- SAGARPA
- CONANP
- CONAFOR
- CONABIO
- CONAPESCA
- I.P.
- SEGOB – P.C.
- SEMAR
- SEDENA
- SCT – SENEAM
- CFE
- PEMEX
- INIFAP
- WMO
- NOAA
- COI
- Etc.



Cozumel EMA

## Automatic and Synoptic Weather Station Networks, -EMAs and -ESIMEs

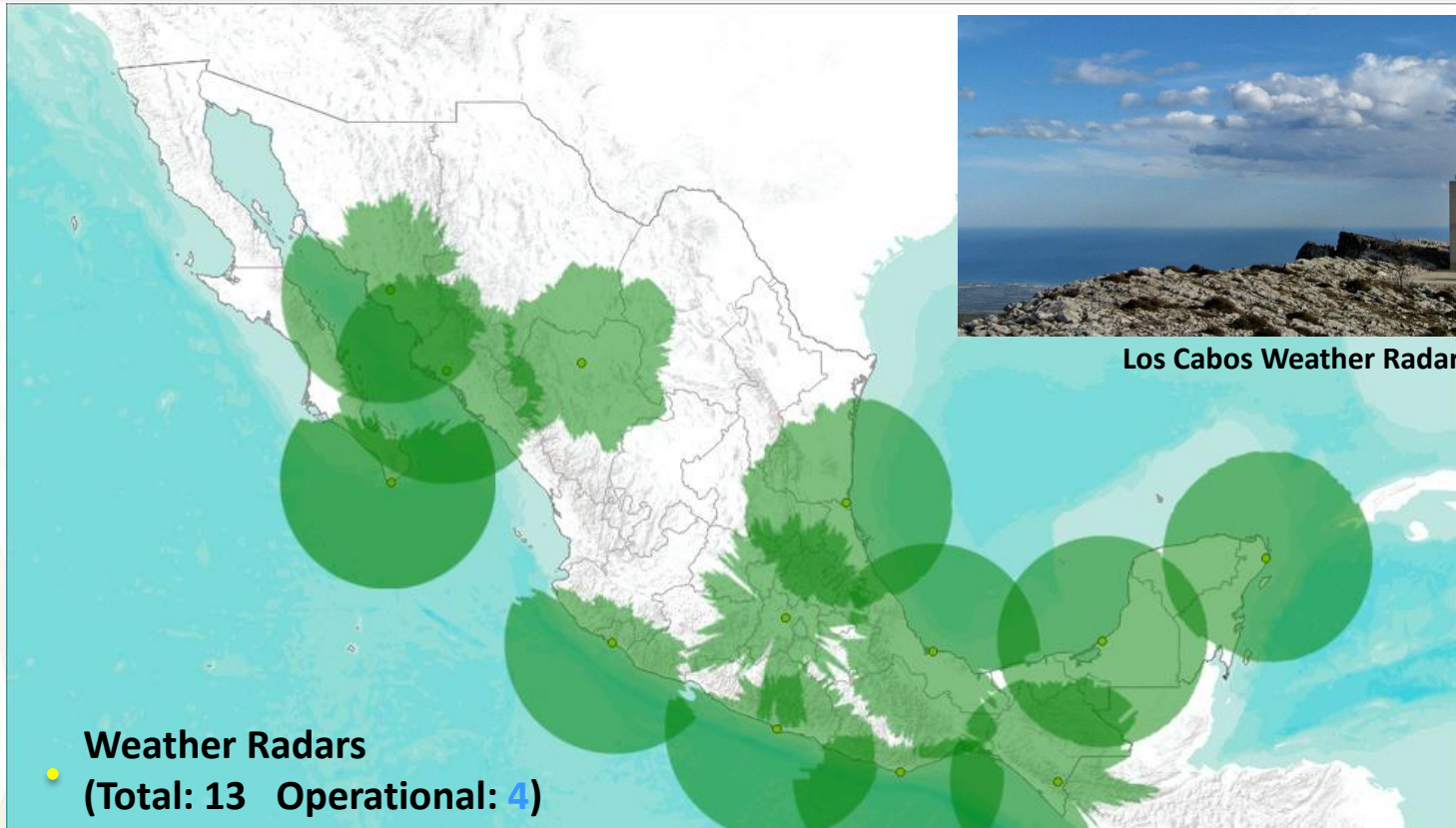
Sensor	Variable	Frequency	Accessibility time	Transmission Type
Pluviometer	Precipitation	10 min.	1 hr.	CONAGUA's Voice and Data LAN
Pluviometer	Precipitacion	10 min.	1 hr.	CONAGUA's Voice and Data LAN



- **Meteorological and Synoptic Observatories**  
(Total: 77 Operational: 75)

**Meteorological and Synoptic Observatory Networks**

Sensor	Variable	Frequency	Products	Accessibility time	Transmission Type	Characteristics Type / Model
Rain gauge	Accumulated Precipitation	1, 3, 6 , 24 hr.	SYNOPTIC	Hourly	CONAGUA's Voice and Data LAN	Rain recorder / Tipping bucket
Pluviometer	Accumulated Precipitation	24 hr.	SYNOPTIC	Daily	CONAGUA's Voice and Data LAN	Total type with measured tube



Los Cabos Weather Radar

## C-BAND DOPPLER Weather Radar Network

Sensor	Variable	Frequency	Products	Accessibility time	Transmission Type
Weather RADAR	Precipitation	15 min.	IACM (Interactive Accumulation) VIL (Vertically Integrated Liquid) ACM (Rain Accumulation 1-hour, 12 hours, 24 hours)	15 min.	CONAGUA's Voice and Data LAN



**SEMARNAT**

SECRETARÍA DE MEDIO AMBIENTE  
Y RECURSOS NATURALES

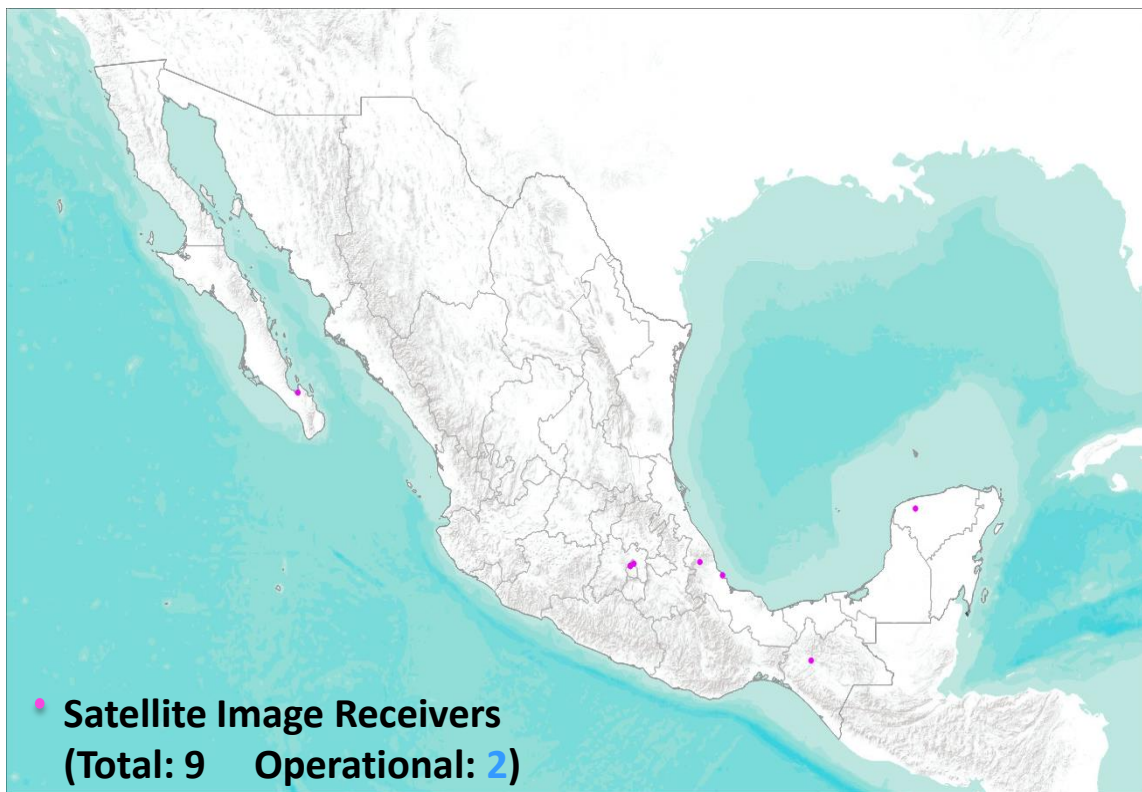
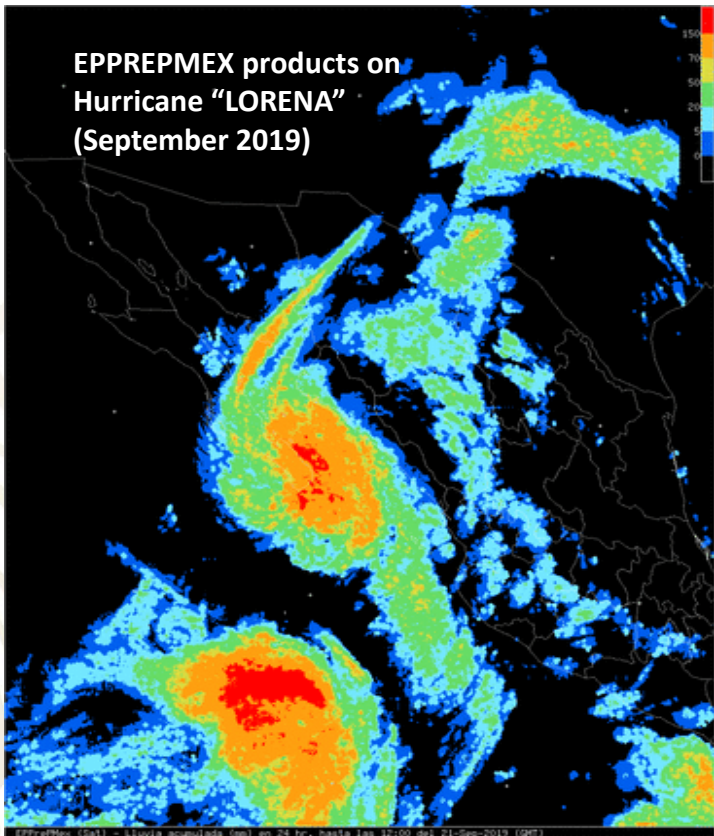


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## Satellite Image Receivers –ERIs Network

**EPPREPMEX products on  
Hurricane "LORENA"  
(September 2019)**



**Satellite image receiver stations –ERIs Network**

Sensor	Variable	Frequency	Products	Format	Accessibility time	Transmission Type
GOES Imager	Estimated Precipitation (EPPREPMEX)	1, 3 and 24 hr. (mainly).	Image	GIF	1, 3 and 24 hours	CONAGUA's Voice and Data LAN



**Radiosounding Network**

Sensor	Variable	Frequency	Products	Format	Accessibility time	Transmission Type
Radiosonde	Relative Humidity	12 hrs.	Raw data and images	-Native -BUFR and TEMP	2 hr.	FTP CONAGUA's Voice and Data LAN



**SEMARNAT**

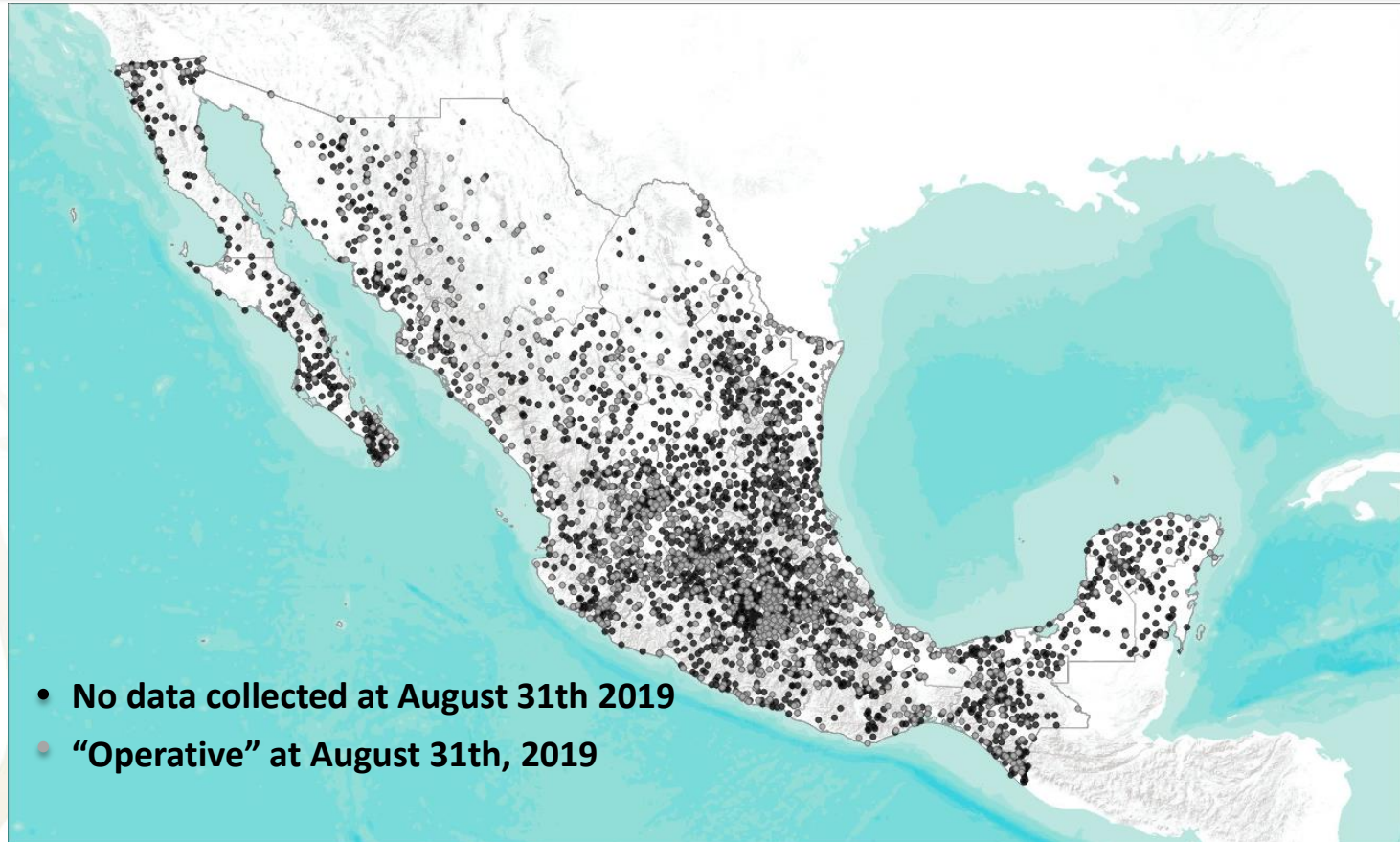
SECRETARÍA DE MEDIO AMBIENTE  
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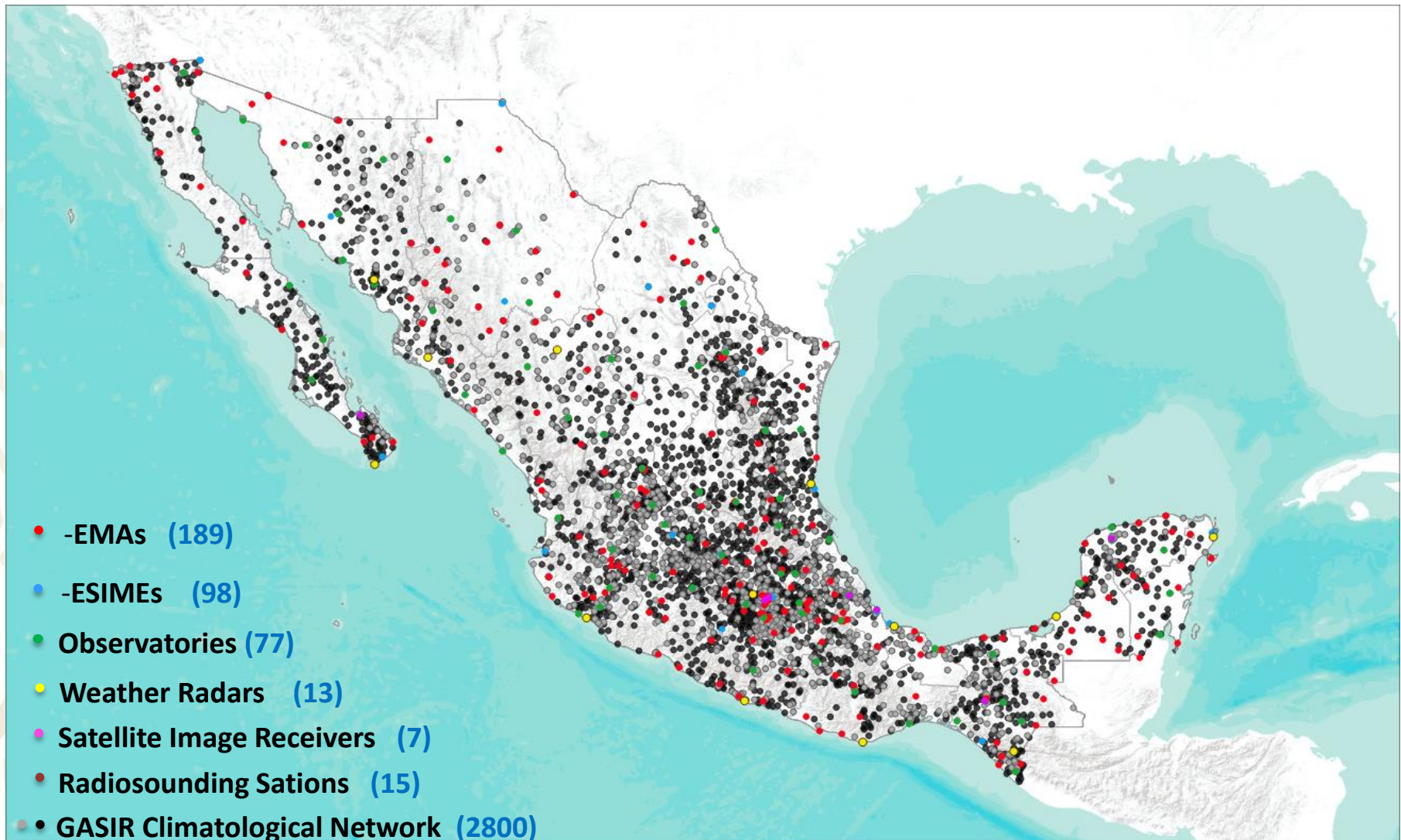
## Climatological Observational Network CONAGUA-GASIR



- No data collected at August 31th 2019
- “Operative” at August 31th, 2019

### Climatological Observational Network operated by “gratified” personnel, administrated by CONAGUA-GASIR

Sensor	Variable	Frequency	Accessibility time	Transmission Type	Characteristics Type / Model
pluviometer	Accumulated Precipitation	Daily (24 hrs.) 8:00 am - 11:00 am	24 hours to 6 months	Phone, radio, e-mail, mail service, etc.	receiver cylinder with graduated tube



### Challenges:

- ❖ Densification of the weather monitoring networks.
- ❖ Take advantage of the current communication networks (mobile devices, social network).
- ❖ Social education about environmental conservation.
- ❖ Collaboration between public institutions, academy and private sectors.



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Thank you