



## **WMO/GWP Integrated Drought Management Programme (IDMP)**

# **Mexico's Drought Persistence Monitor (MPSMx)**

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## **Mexico's Drought Persistence Monitor (MPSMx) (IMTA, 2017).**

It is a system that comprises a series of probabilistic models and computer programs to calculate 5 indices independently.

<http://galileo.imta.mx/mx/vistas/sequia.php>

Each of these indices is calculated for different periods and represents the cumulative probability for a period, as well as the duration, intensity and magnitude of dry periods.

The monthly information comes from:

- SPI
- Standardized temperature Index
- SPEI
- Standardized Soil Moisture Index
- NDVI

## GOES 18

### Sensor Advanced Baseline Imager (ABI)

It has 16 spectral bands (compared to 5 of the previous generation of GOES) and will provide three times more spectral information.

It determines 34 variables, including Terrestrial Surface Temperature.

In process 31, including the Vegetation Index.

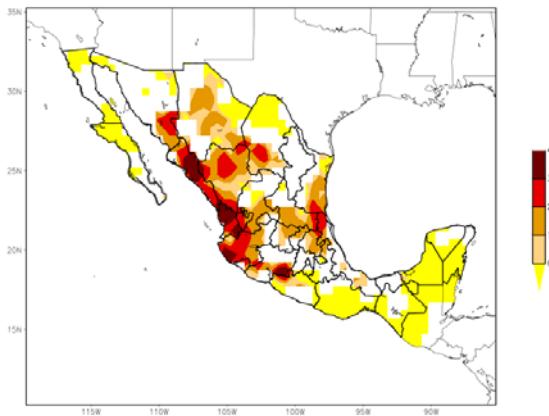
Information that can be integrated into the MPSMx for greater spatial and temporal coverage of drought.

Variable	Source	Data available
Precipitation	Climate Prediction Center (Global Monthly Land Surface Analysis) Pixel size: 0.5 deg  CHIRPS: Climate Hazards Group InfraRed Precipitation with Station data	January/1948 March/2017
<a href="ftp://ftp.cpc.ncep.noaa.gov/wd51yf/global_monthly/gridded_binary/p.long">ftp://ftp.cpc.ncep.noaa.gov/wd51yf/global_monthly/gridded_binary/p.long</a> <a href="http://chg.geog.ucsb.edu/data/chirps/">http://chg.geog.ucsb.edu/data/chirps/</a>		
Variable	Source	Data available
Temperature	Climate Prediction Center (Global Monthly Land Surface Analysis) Pixel size 0.5 deg	January/1948 March/2017
<a href="ftp://ftp.cpc.ncep.noaa.gov/wd51yf/global_monthly/gridded_binary/t.long">ftp://ftp.cpc.ncep.noaa.gov/wd51yf/global_monthly/gridded_binary/t.long</a>		
Variable	Source	Data available
Soil Moisture	Climate Prediction Center (Global Monthly Land Surface Analysis) Pixel size: 0.5 deg	January/1948 March/2017
<a href="ftp://ftp.cpc.ncep.noaa.gov/wd51yf/global_monthly/gridded_binary/w.long">ftp://ftp.cpc.ncep.noaa.gov/wd51yf/global_monthly/gridded_binary/w.long</a>		
Variable	Source	Data available
NDVI	LP DACC(Land Processes distributed active archive center) MODIS Satelite – Aqua Pixel size: 0.05 deg	February/2000 March2017
<a href="https://e4ftl01.cr.usgs.gov/MOLT/MOD13C2.006/">https://e4ftl01.cr.usgs.gov/MOLT/MOD13C2.006/</a>		

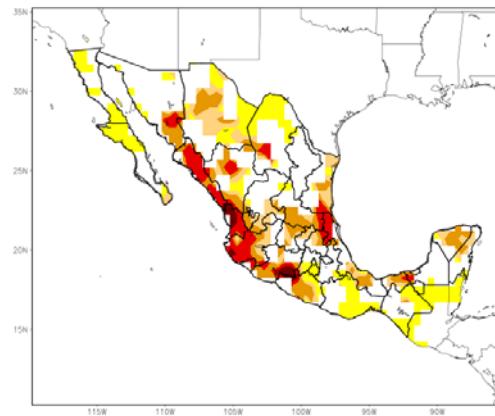
# Weighted Temporal Scale Map of the Droughts

Each map represents the "persistence" of the drought, so that periods of drought can be observed: short (3 months), medium (6 to 9 months) and long (> one year).

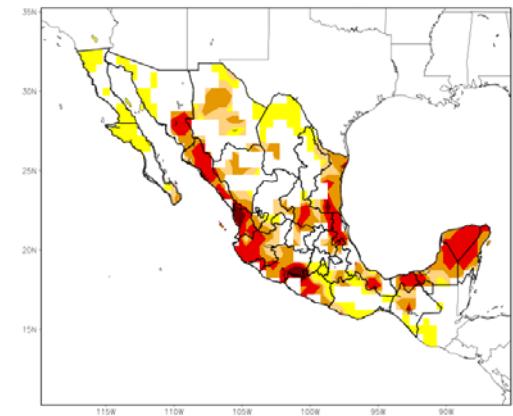
1 month



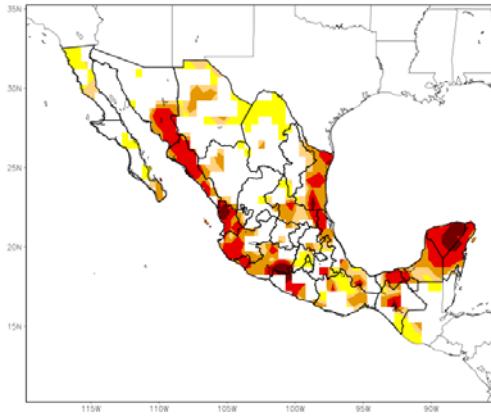
June, 2017  
3 months



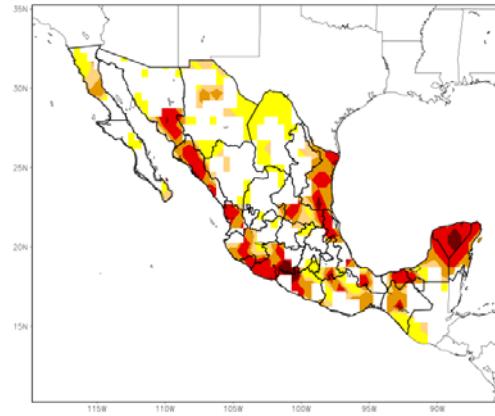
6 months



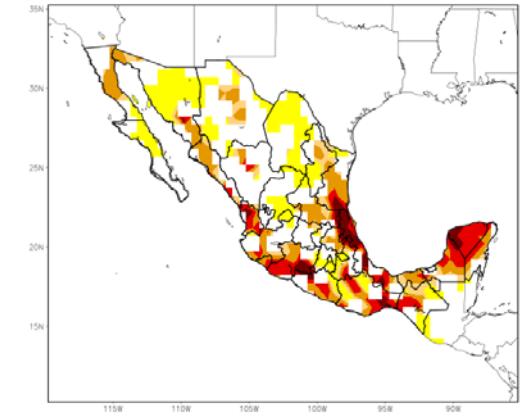
9 months



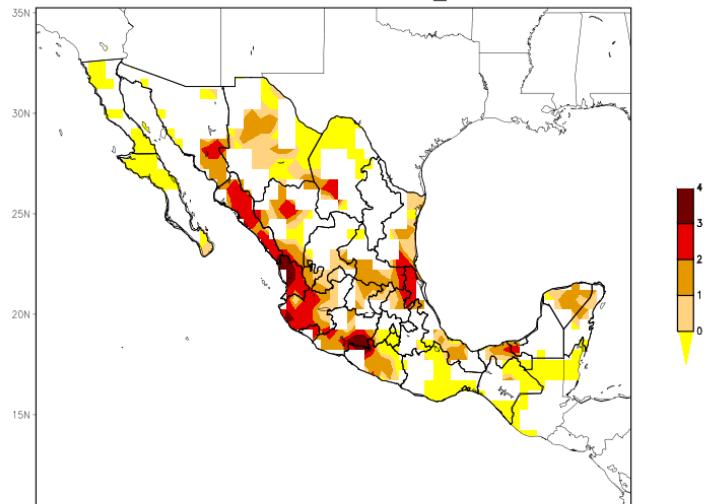
12 months



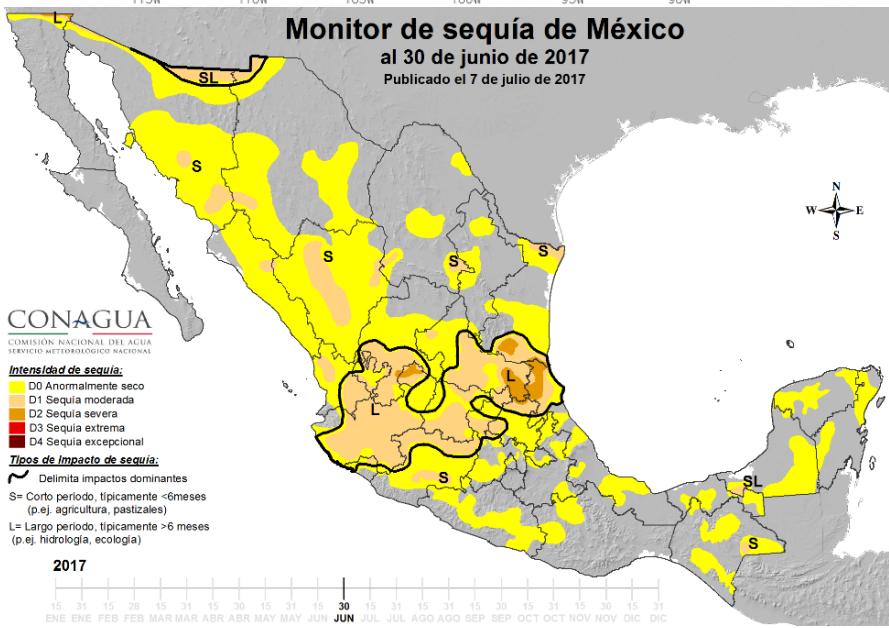
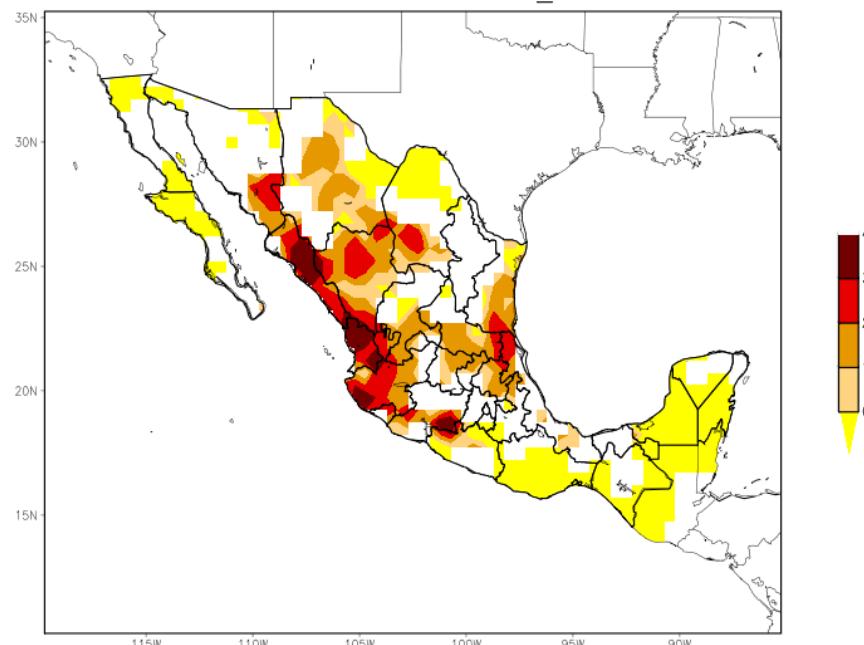
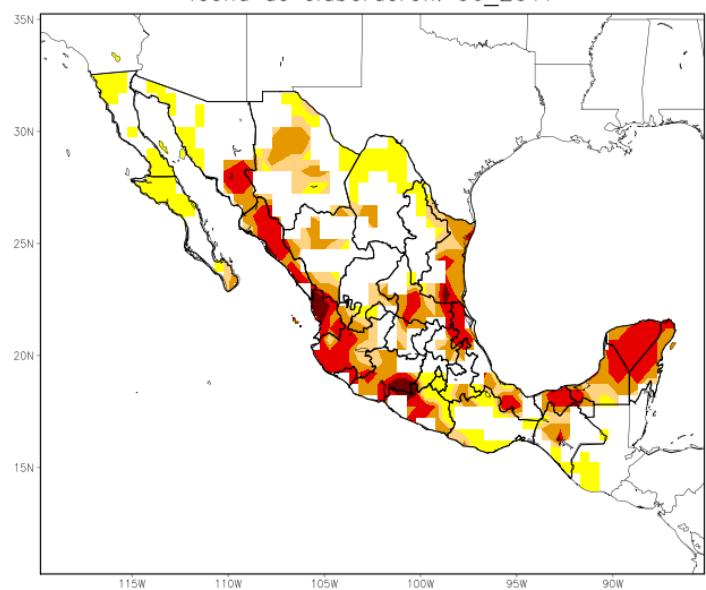
24 months



Mapa ponderado de escala temporal de la sequía (MPET) a 03 mes/meses  
fecha de elaboración: 06\_2017



Mapa ponderado de escala temporal de la sequía (MPET) a 06 mes/meses  
fecha de elaboración: 06\_2017



## Conclusions

- Satellite information is the tool of the future for drought monitoring in the world given the growing scarcity of terrestrial monitoring
- The MPSMx is oriented to the water and agricultural sectors but with adjustments it is useful to others. Even in the context of climate change.
- The Mexico Drought Information System (SISMx) uses available technical bases and will be used in decision-making for the implementation of the national policy against drought.
- The SISMx has a great viability to be replicated in other countries and extended to Central and South America



WORLD  
METEOROLOGICAL  
ORGANIZATION



Servicio  
Meteorológico  
Nacional



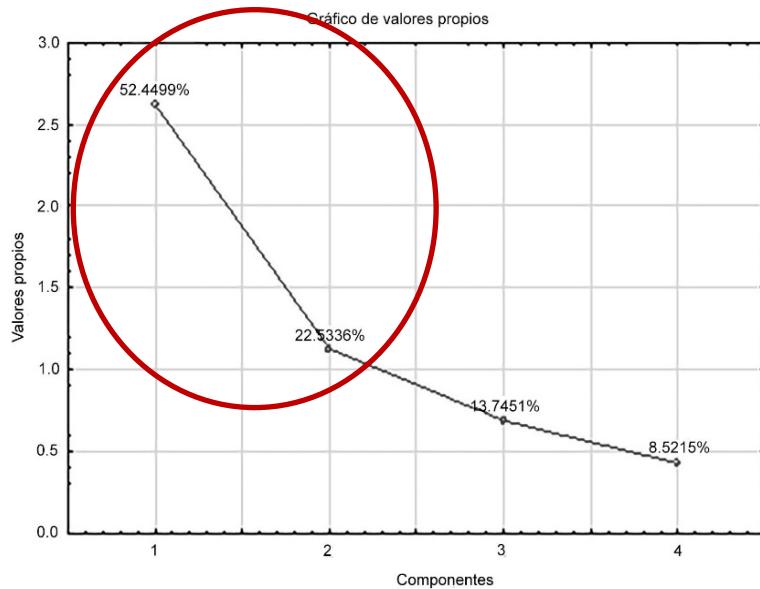
# Thank you

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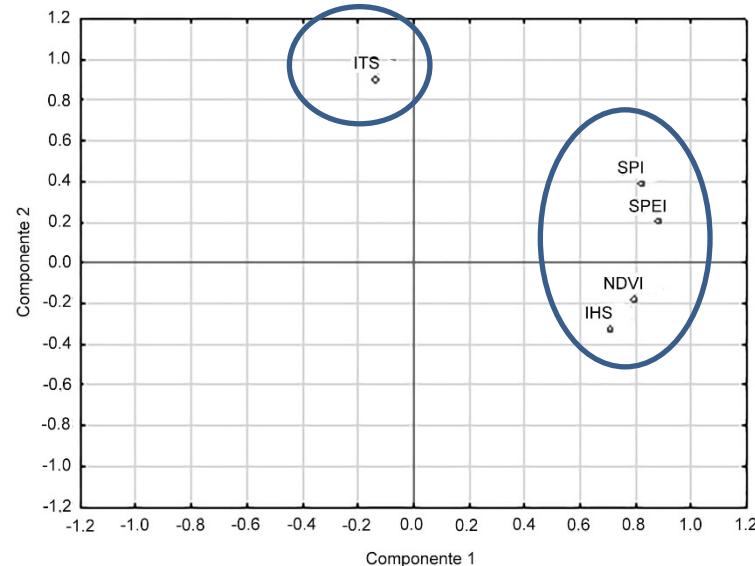


# Ponderación: Asignación de pesos

- Análisis de componentes principales (CP) para identificar los índices que explican la mayor parte de la varianza total de la sequía de acuerdo a sus valores propios.
- Las primeras dos componentes explicaron la mayoría proporción de la varianza. **Fig. A.**
- De acuerdo a sus valores propios, se conformaron dos grupos de índices: 1) SPEI, SPI, SNDVI y SSMI y 2) STI. **Fig. B,**



**Fig. A.**



**Fig. B.**

- Se asignaron pesos iniciales a los índices con base en los resultados de las CP, que se ajustaron a partir de una revisión cualitativa del menor número de píxeles con dato mensual de sequía sin coincidencias entre los mapas del IPS con los del SMN, del año 2008 y 2011; baja y alta señal de sequía en México.

# Vinculación de los componentes de la Política Nacional contra la Sequía

Comisión Intersecretarial para la Atención de Sequías e Inundaciones (CIASI) – (13 instituciones federales) *Toma de decisiones, seguimiento*

