

# Digital Map of Mexico Platform and MxSIG

March 2017



INSTITUTO NACIONAL  
DE ESTADÍSTICA Y GEOGRAFÍA

## I. Digital Map of Mexico Platform

- Concept
- Evolution

## II. Digital Map of Mexico online

- Concept
- Capabilities
- Information available
- Other state units information

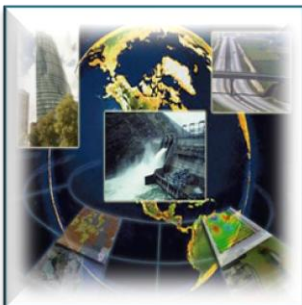
## III. Digital Map of Mexico for desktop

- Concept
- Formats
- Spatial and statistics analysis

## IV. MxSIG

- Concept
- Advantages
- Resources available
- Free software components
- Standardized services
- Activities for third parties

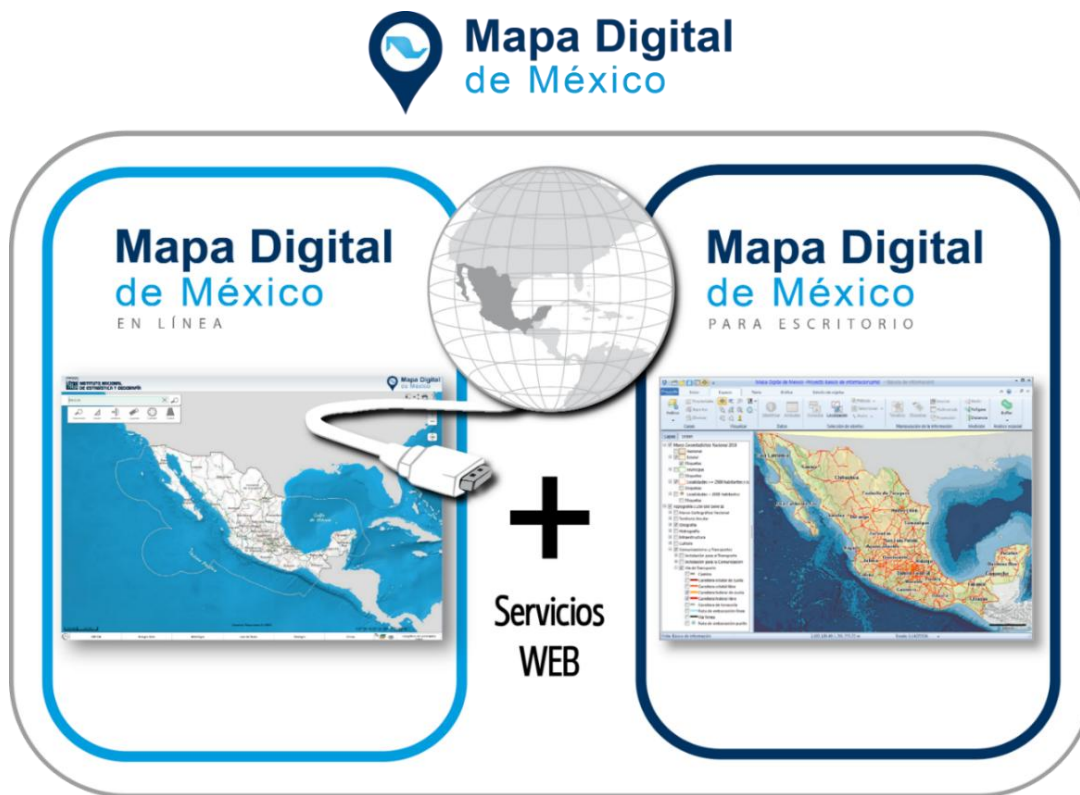




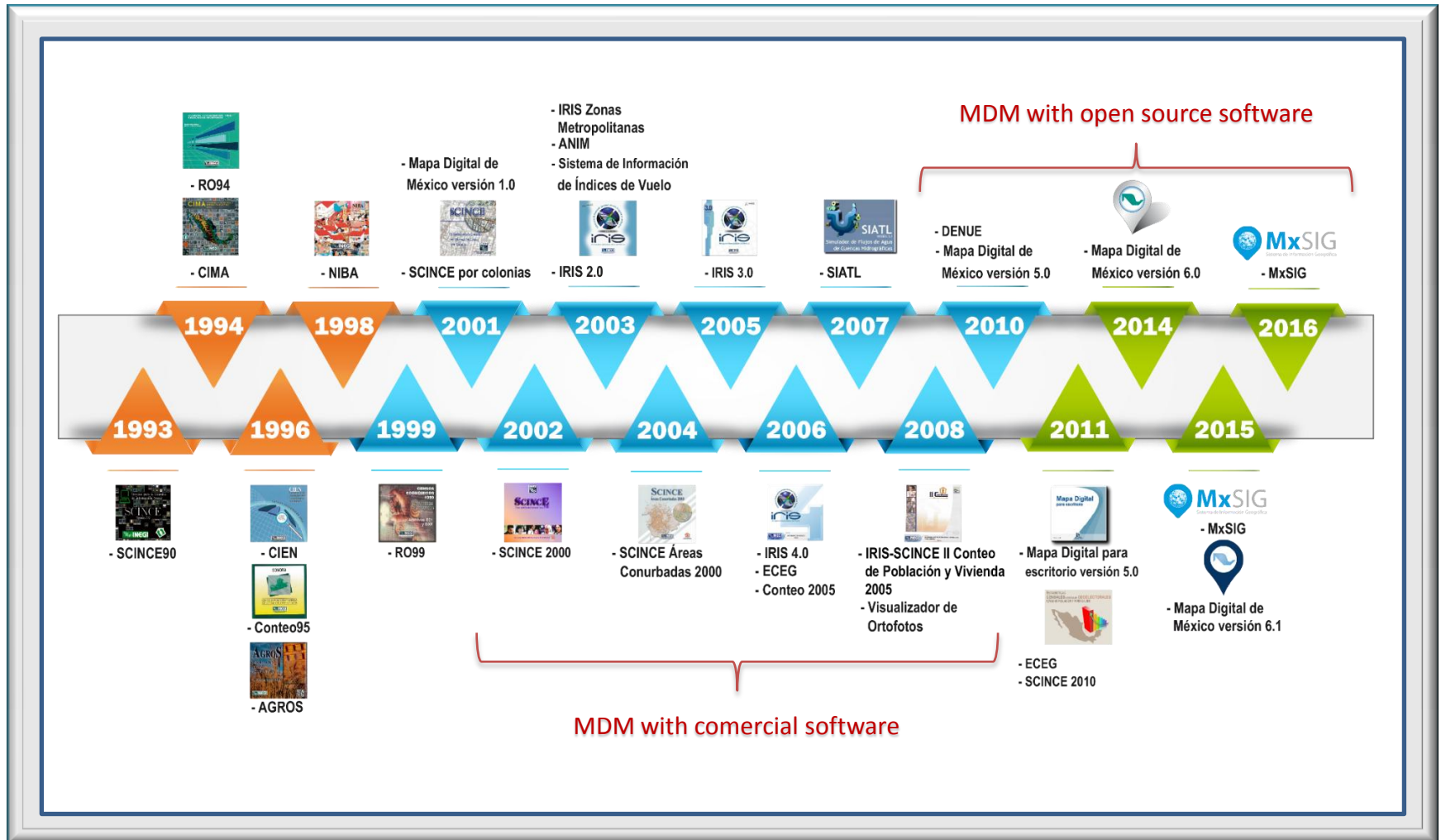
# I. Digital Map of Mexico Platform

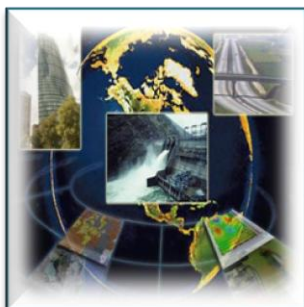
## Concept

The Digital Map of Mexico (MDM for short) Platform is a set of software tools that allows the integration, construction, query, interpretation and analysis of geographic and georeferenced statistical information.



## Evolution





## II. Digital Map of Mexico online



## Concept



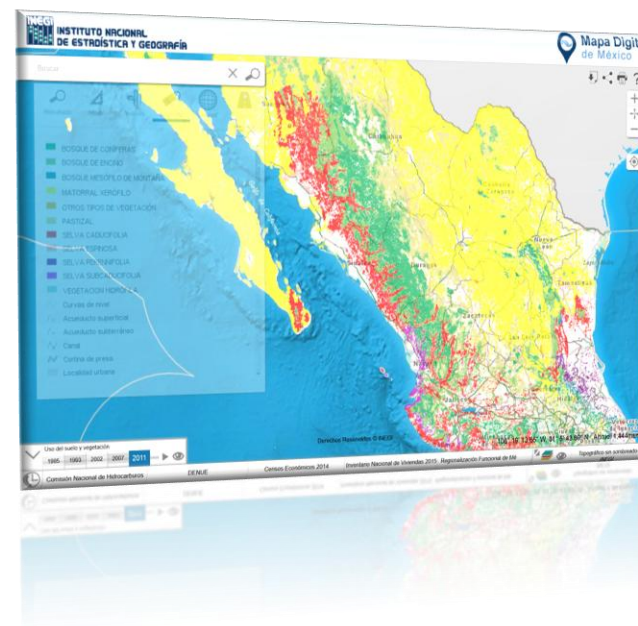
## Mapa Digital de México

EN LÍNEA

**Geographic Information System** that provides a web-computing platform to facilitate the use, interpretation and analysis of geographic information and georeferenced statistics.

### Main users:

- ☐ Decision makers
- ☐ Students
- ☐ People without experience in Geographic Information Systems
- ☐ General citizens



## Digital Map of Mexico online



### As Viewer of geographic and statistical information

### As Geographic Information System

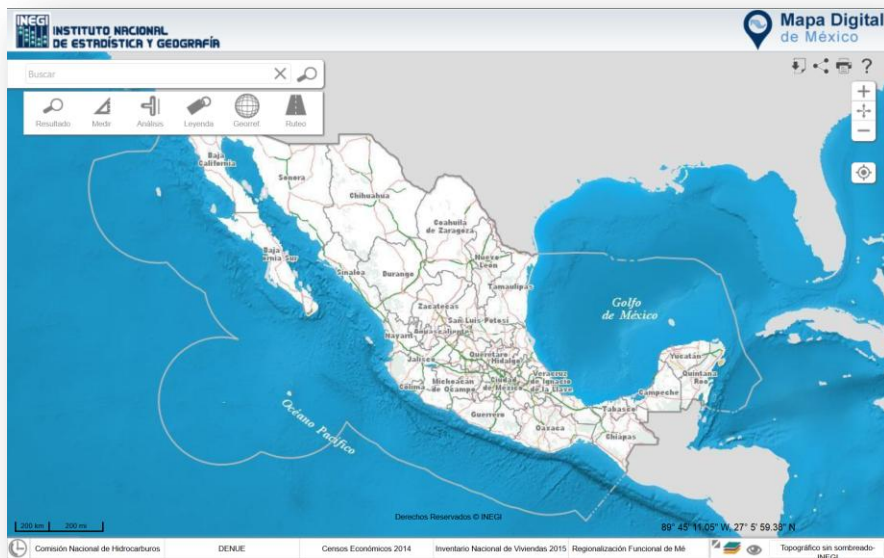
- ☐ To digitize geometries
- ☐ Perform spatial analysis: Areas of influence, intersection, Contents, Data export.
- ☐ Trace source-destination routes and obtain optimal routes.

### As SDI

- ☐ Incorporate WMS, WFS, TMS and WMTS map web services.
- ☐ Download queries and analysis in data or image formats: pdf, xls, cvs, jpg, png and gif.



## Information available



<http://www.inegi.org.mx/geo/contenidos/mapadigital/default.aspx>

- ☐ No cost and under international OGC standards.
- ☐ Freedom of use and distribution
- ☐ With a network of users, it is subject to continuous improvement.
- ☐ A new version is released every year.
- ☐ Adaptable to different project needs.

☐ More than 225 layers of information and more than 71 million geographic objects, organized into 42 themes.

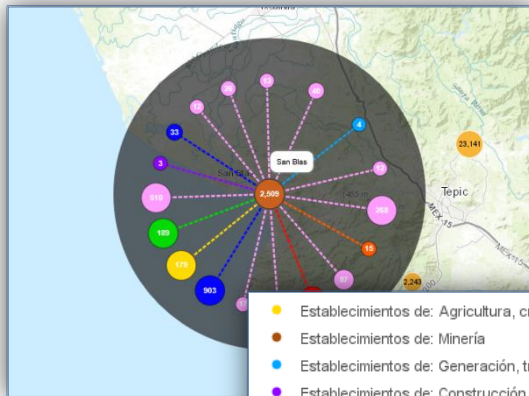
☐ Base Maps:

1. Topographic with and without shading – INEGI
2. Hypsographic – INEGI
3. Orthophotos – INEGI
4. Open Street Map
5. Google Satellite
6. Esri Map

## Highlighted information

### National Directory of Economic Units

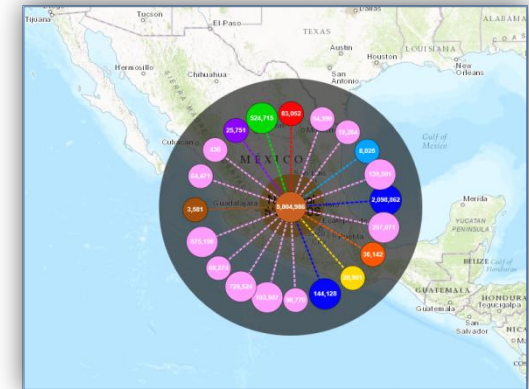
- Economic units DENUE  
(4'926,061 geo-referenced economic units)



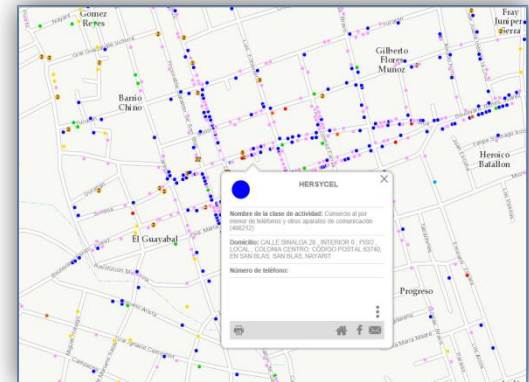
Economic Units,  
municipality of San  
Blas, Nayarit, Mexico

- Establecimientos de: Agricultura, cría y explotación de animales
- Establecimientos de: Minería
- Establecimientos de: Generación, transmisión y distribución de energía eléctrica
- Establecimientos de: Construcción
- Establecimientos de: Industrias manufactureras
- Establecimientos de: Comercio
- Establecimientos de: Transportes, correos y almacenamiento
- Establecimientos de: Servicios
- Establecimientos de: Actividades legislativas, gubernamentales, de justicia y de organizaciones políticas
- Agrupación de establecimientos del DENUE

Economic Units,  
Mexican Republic



Economic Units,  
City of San Blas,  
Mexico



## Highlighted information

### Economic Censuses 2014

- ☐ Geographical levels
  - Federal Entity
  - Municipality
- ☐ Statistical data
  - 12 Economic variables
  - 11 Analytical Relationships
- ☐ Sectors of activity
  - Manufacturing industry
  - Commerce
  - Private non-financial services



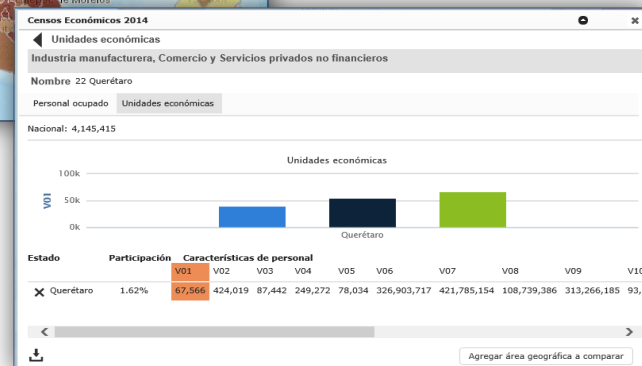
**Censos Económicos 2014**

Unidades económicas

Industria manufacturera, Comercio y Servicios privados no financieros

Nombre 14 Jalisco

Variables económicas			
	2004	2009	2014
Unidades económicas (unidades)	209,115	260,067	308,138
Personal ocupado total (personas)	1,094,516	1,355,766	1,455,400
Personal ocupado no remunerado (personas)	322,977	438,663	443,699
Personal ocupado remunerado (personas)	660,704	718,302	778,598
Personal ocupado suministrado (personas)	86,323	176,213	198,033
Gastos por consumo de bienes y servicios (miles de pesos)	403,322,056	640,944,585	744,656,358
Ingresos por suministro de bienes y servicios (miles de pesos)	540,736,244	842,160,372	1,006,446,191
Activos fijos totales (miles de pesos)	150,019,312	227,244,548	279,519,975
Producción Bruta total (miles de pesos)	343,048,432	489,893,599	641,396,149
Valor agregado (miles de pesos)	146,988,659	207,193,427	255,566,154
Valor de la energía eléctrica consumida (miles de pesos)	4,120,478	9,395,902	10,216,703
Valor del consumo de agua (miles de pesos)	89,514	1,484,254	2,085,219
Relaciones Analíticas			
Promedio de establecimientos por manzana (unidades promedio)	1.6	1.6	1.6



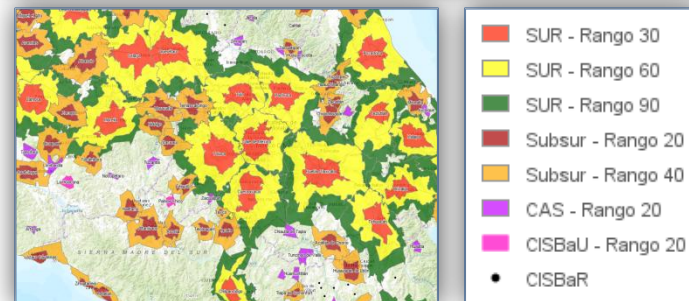
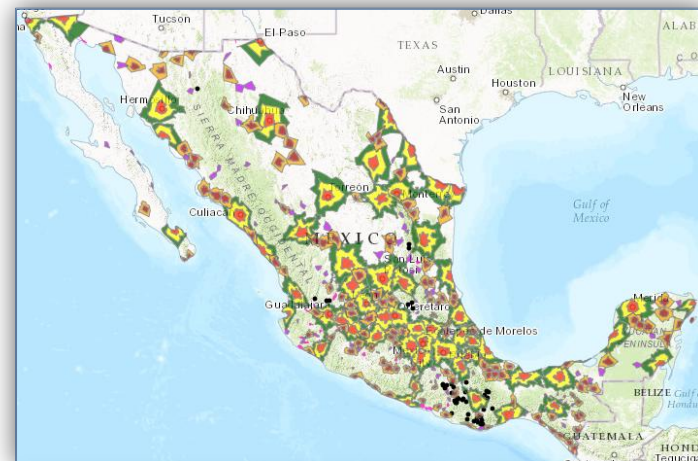
## Other state units information

### Functional Regionalization of Mexico

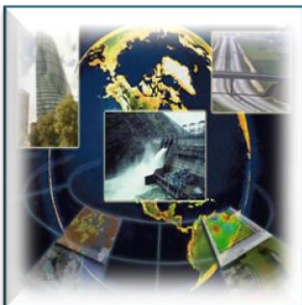
- ☐ Rural Urban Systems
- ☐ Rural Urban Subsystems
- ☐ System Articulating Centers
- ☐ Integration Centers of Basic Urban Services
- ☐ Integration Centers of Rural Basic Services
- ☐ Scattered locations
- ☐ Potential Urban Rural Subsystems
- ☐ Potential System Articulating Centers
- ☐ Potential Service Integrator Centers
  - ☐ Urban Basics
  - ☐ Rural Basics

Source:

**SEDATU**  
SECRETARÍA DE DESARROLLO  
AGRARIO, TERRITORIAL Y URBANO



Center of the Mexican Republic



### III. Digital Map of Mexico for desktop



## Concept



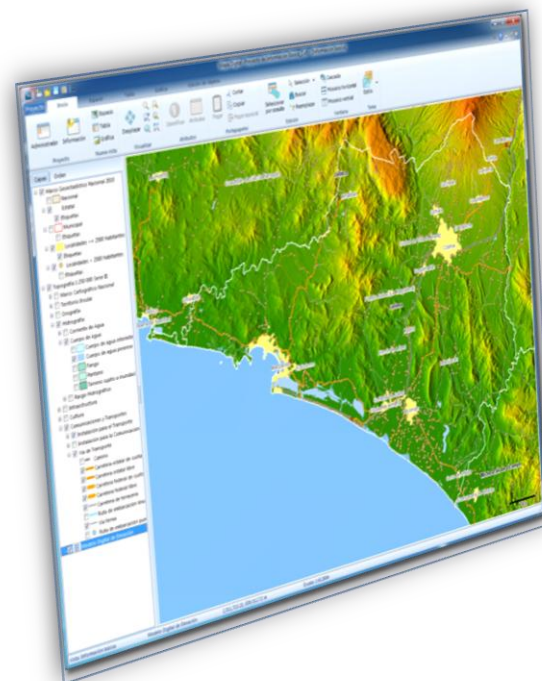
## Mapa Digital de México

PARA ESCRITORIO

**Geographic Information System** for desktop that is developed to promote and facilitate the integration, interpretation, analysis and use of geographic information and georeferenced statistics.

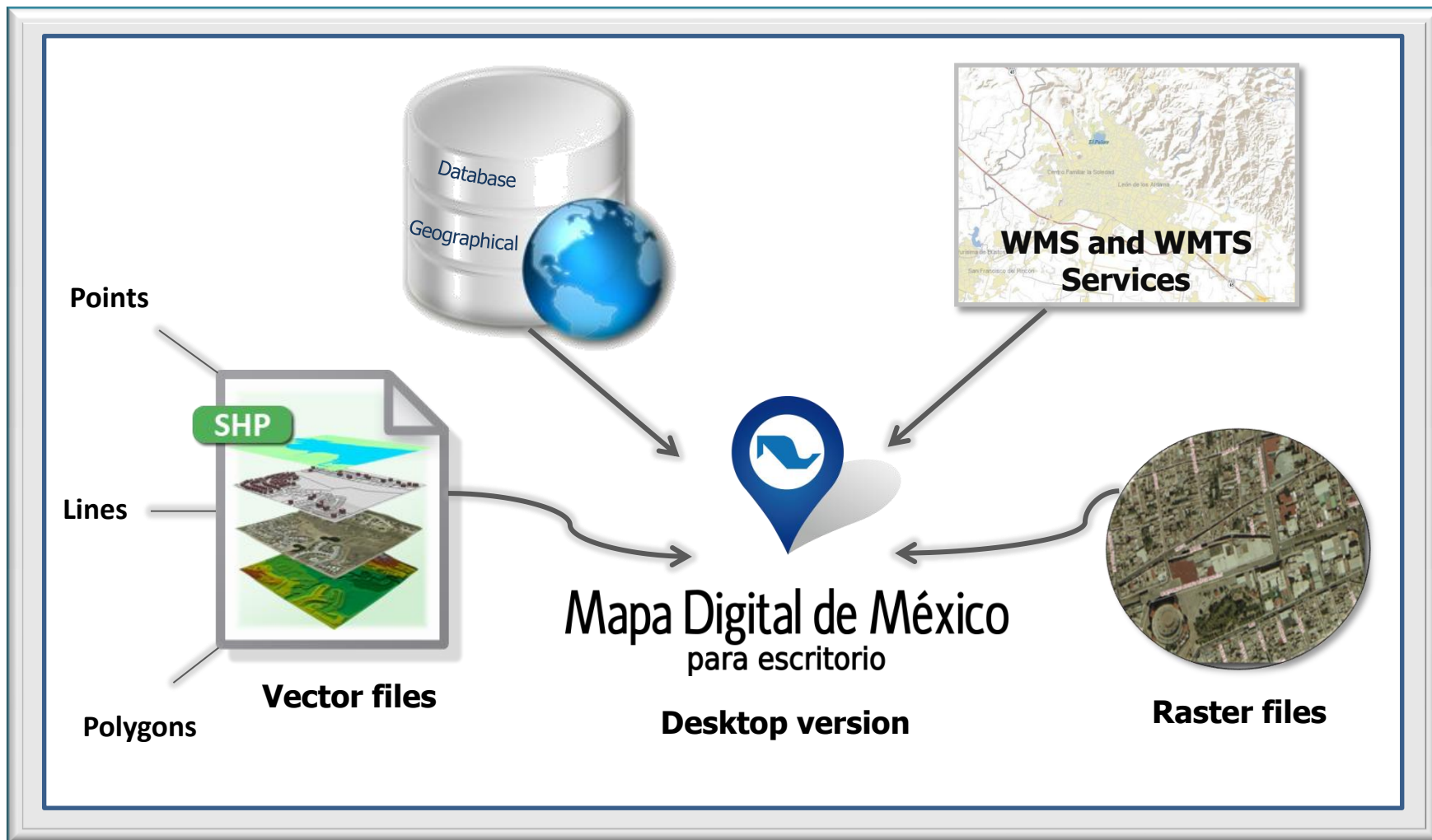
### Main Users:

- ☐ Researchers
- ☐ College students
- ☐ People with experience in data analysis

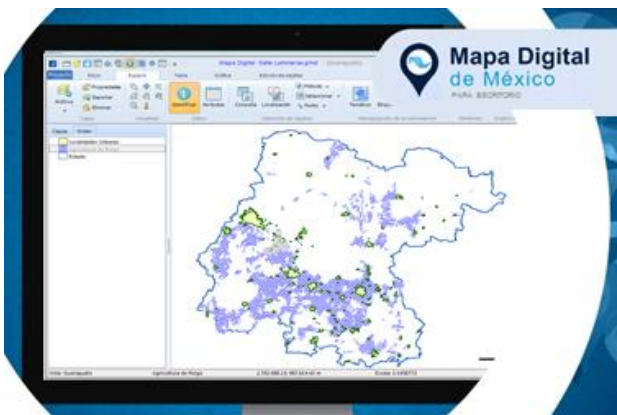
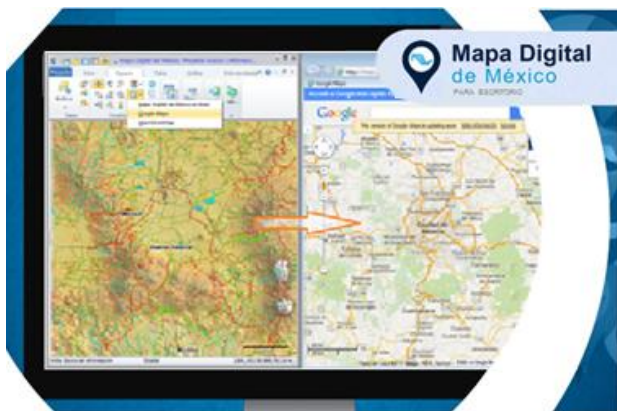




## Formats



## Spatial and Statistical Analysis



### ☐ Perform statistical analysis

- Thematic maps, descriptive statistics, linear correlation, multivariate stratification, etc.

### ☐ Associate documentary and tabular information

- Txt, .doc, .pdf, .xls, etc.

### ☐ Perform spatial analysis operations

- Extraction, intersection, fusion, union, buffer, Thiessen polygons, Delaunay triangulation, dissolution, decomposition, etc.

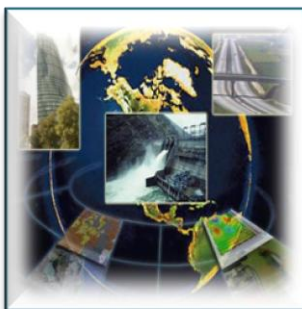
### ☐ Other capabilities

- Support WMS and WMTS standard services
- Add and manage using coordinates
- Locate objects using coordinates
- View files in CAD DXF, DGN, DGN y GPX format
- Get coordinates, etc

## Training activities

- ❑ **Objective:** To induce the knowledge and use of the tool, through analysis on geographic and statistical information, in order to facilitate to the users the analysis, interpretation and integration of geospatial information.
- ❑ **Modalities:**
  - 1) Executive Workshop (4 hours)
  - 2) Basic workshop (24 hours).
- ❑ **Coverage:** Instructors in all states of Mexico.
- ❑ **Impact:** More than 200 courses and more than 2,000 participants in the last 4 years.





## IV. MxSIG

## Concept



# MxSIG

Sistema de Información Geográfica

**Open source platform** developed at INEGI to **implement geomatics solutions for the web** that facilitate the use, integration, interpretation, publication and analysis of geographic information and georeferenced statistical information.

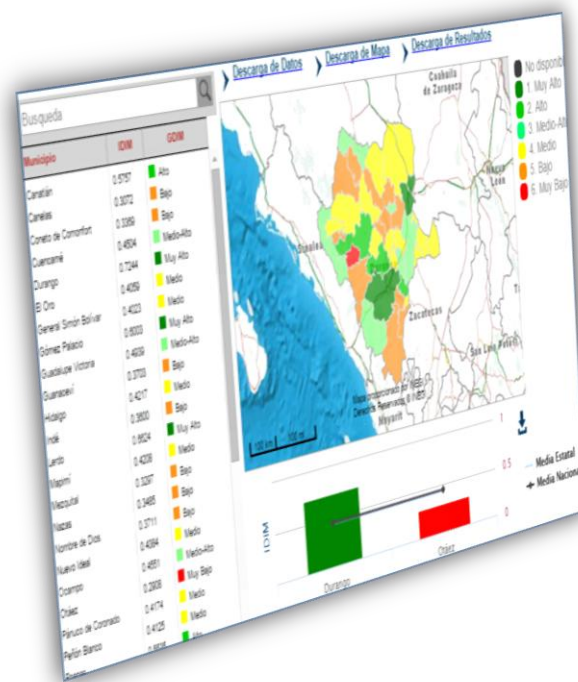
Digital Map of Mexico on line is powered by MxSIG.



MDM



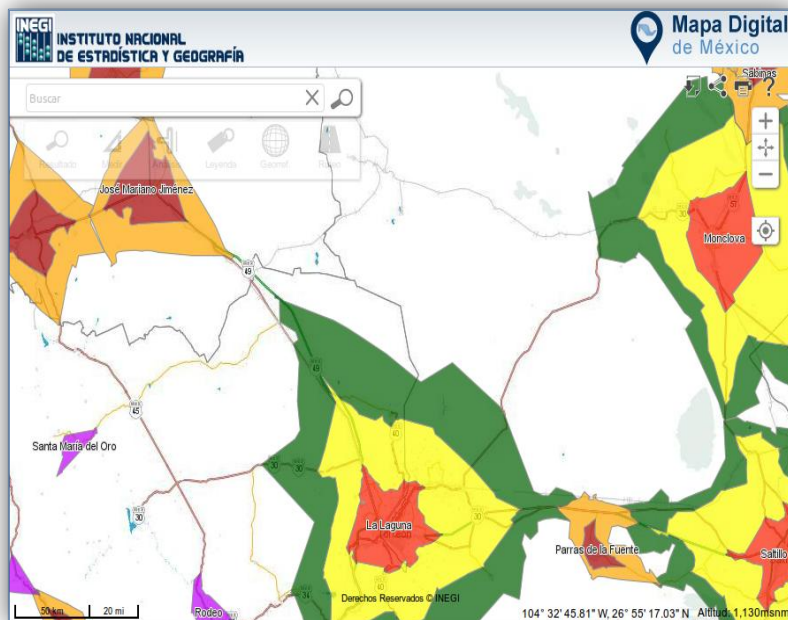
MxSIG





## Advantages

- ❑ It allows the development of different types of projects and applications with georeferenced information, from a simple viewer with one or two layers of information, to a complete web GIS.
- ❑ Enables user to interact with hundreds of layers of geographic objects and perform spatial analysis on them.



- ❑ It implements advanced functionalities: buffer creation, map algebra, statistical analysis, digitization, timeline, etc.
- ❑ It is based on software with open source license; free of royalty.
- ❑ Supports OGC interoperability standards for geographic information; it can be used in the implementation of national, regional or global SDI, or integrate with existing SDIs.

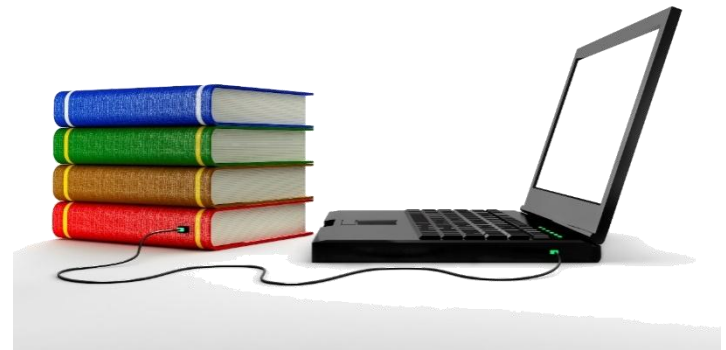


## Resources available

- ☐ **Compiled application**  
On INEGI's site
- ☐ **Source code**  
On GitHub
- ☐ **Installation Guide**  
On INEGI's site



**github**  
SOCIAL CODING



## Open source components



Apache  
HTTP SERVER PROJECT



- ☐ PostgreSQL/PostGIS
- ☐ MapServer
- ☐ Open Layers
- ☐ Apache Tomcat
- ☐ Apache HTTP Server
- ☐ jQuery

## Standard services

Supports and promotes the interoperability standards of the Open Geospatial Consortium and the Open Source Geospatial Foundation

### Web Services supported

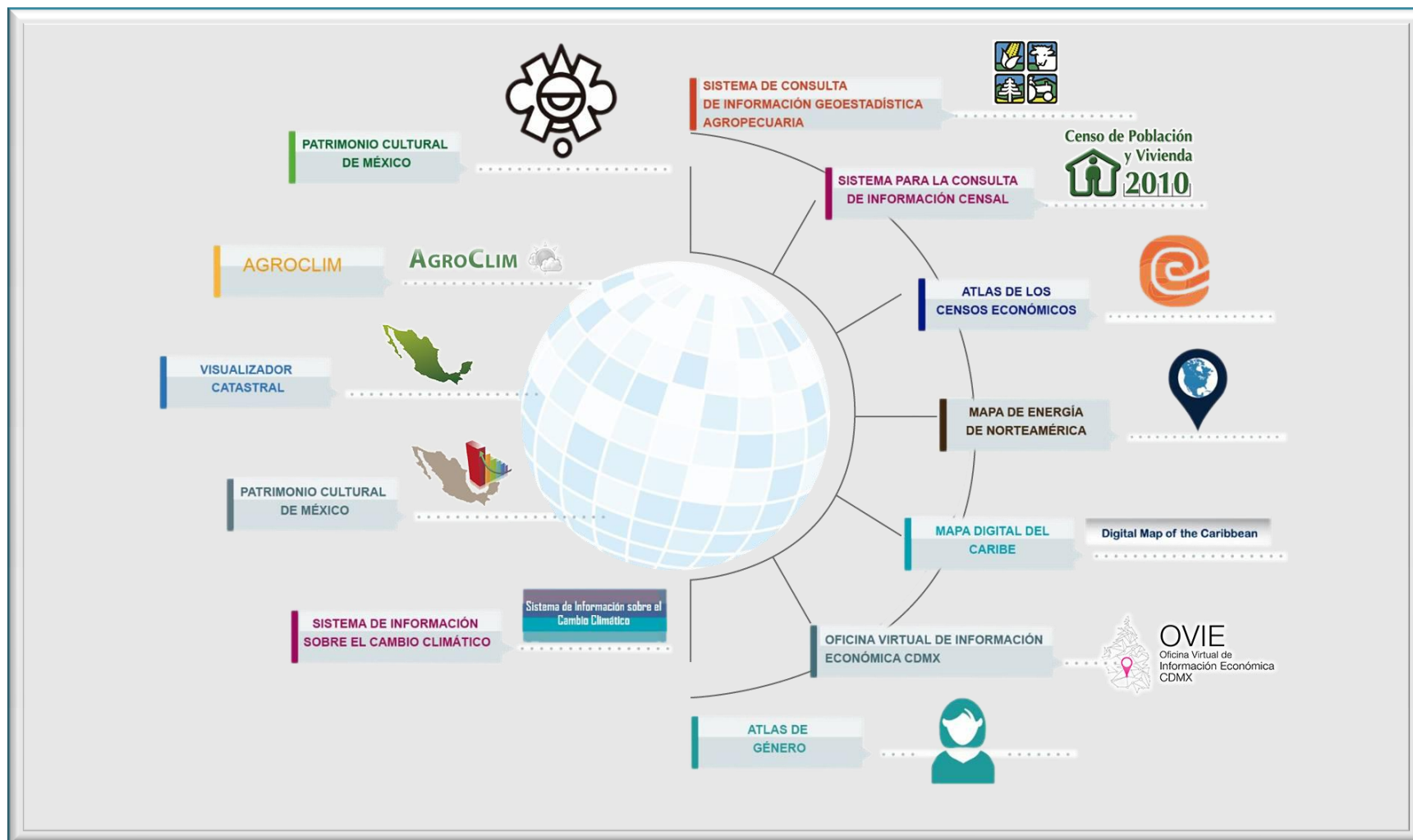
- ☐ WMS
- ☐ WFS
- ☐ WMTS
- ☐ TMS
- ☐ WMS-T
- ☐ WCS



**OGC<sup>®</sup>**  
Making location count.



## Developed applications



Thank you for your  
attention



INSTITUTO NACIONAL  
DE ESTADÍSTICA Y GEOGRAFÍA