

National Institute of Statistics and Geography

Direction General of Geography and Environment

National Report 2008-2011

International Cartographic Association
Association Cartographique Internationale



Introduction

Within the agenda of the General Assembly of the International Cartographic Association, to be held on July 3 - 8, 2011, a review of the activities undertaken by its members is included. Therefore, this paper was prepared as a summary of the activities related to geographic and environmental information and that have been performed by the Direction General of Geography and Environment of the National Institute of Statistics and Geography during 2008 through the first half of 2011.

Of great importance is that according to the reform applied to the articles 26 and 73 of the Constitution of the United Mexican States, published in the Official Journal of the Federation (DOF, Diario Oficial de la Federación) on April 7, 2006, the Mexican State must have a National System of Statistical and Geographical Information (SNIEG, Sistema Nacional de Información Estadística y Geográfica). For the regulation of the modifications already mentioned, on April 16, 2008, the Law of the National System of Statistical and Geographical Information (LSNIEG, Ley del Sistema Nacional de Información Estadística y Geográfica) was published in the DOF, establishing the general requirements for the SNIEG constitution and organization, as well as for the technical and management autonomy with legal personality and own assets of the INEGI, in charge of regulating and coordinating the SNIEG.

Understood the SNIEG as a set of units organized by the subsystems, coordinated by the INEGI and articulated by the National Information Network, produces and disseminates Information of National Interest through four subsystems: 1. Demographic and Social, 2. Economic, 3. Geographic and Environmental and 4. Government, Public Security and Application of Justice.

The National Subsystem of Geographical and Environmental Information is divided in the geographic and the environmental components. The geographic component must generate at least the following data groups: geodetic reference frame; coastal, international, state and municipality boundaries; continental, insular and submarine relief; cadastre, topographic, natural resources and climate data, and geographical names. This component is also named the Spatial Data Infrastructure of Mexico (IDEMex, Infraestructura de Datos Espaciales de México).

The environmental component must produce indicators about these themes: atmosphere, water, soil, flora, fauna, hazardous and solid waste. Also, it will describe the status and trends of the environment considering the natural resources, plant and animal species, and other organisms as well.

The report begins with the densification and validation of the National Geodetic Network, following with the acquisition of aerial photographs and satellite imagery, and input for the production and updating of basic and natural resources cartography, up to the generation of topographic and thematic cartography such as edaphology, land use, potential land use, hydrology and climatology. Also included are other important activities like the development of geomatic solutions and the elaboration of technical standards for the production of geographic information.

This report is a continuation of the national report submitted in December 2007, where the activities of the 2003 – 2007 period were included.

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INPUT

1. Geodetic Frame

The Geodetic Frame is information of national interest, as part of the geographic and environmental information component, within the SNIEG integration and development context, becoming one of the main elements for the development of the national geographic information. Geodetic data allows to georeference everything located on the earth surface, being an input for cartographic and cadastre surveys, boundary demarcation, engineering work construction (highways, bridges, dams) and others.

1.1 National Active Geodetic Network (RGNA)

Nowadays, the RGNA (Red Geodésica Nacional Activa) is formed by 22 continuous operating stations along the country, 20 belong to INEGI and 2 are cooperative stations, one from the Territorial Information Institute of Jalisco and the other from the Municipality Institute of Research and Planning, City of Juarez, Chihuahua.



Map of the National Active Geodetic Network Stations

1.2 National Passive Geodetic Network (RGNP)

The RGNP (Red Geodésica Nacional Pasiva) is composed of the horizontal, vertical and gravimetric networks.

1.2.1 Vertical Geodetic Network

This network refers to the definition of the national territory heights with respect to a reference level, materialized by means of 26,108 benchmarks.

1.2.2 Horizontal Geodetic Network

Set of points located on the national territory physically established on monuments or marks more or less permanent, where direct measurements and support of physical parameter measurements were made, allowing their interconnection and positioning with respect to a reference system, International Terrestrial Reference Frame 2008, ITRF08, epoch 2010.0, associated to a reference ellipsoid defined in the Geodetic Reference System 1980, GRS80, using GPS geodetic vertices linked to the RGNA. This network has 77,024 geodetic vertices all over the national territory.

1.2.3 Gravimetric Network

The network defines the external gravimetric field, materialized with a set of points established on the ground, where the accelerated gravity value is measured with respect to a reference system. So far 140,485 stations have been established, 11,823 are on a physical mark.

The table presents a summary of the generation of validated geodetic points during 2008-2011:

Year	Horizontal	Vertical	Gravimetry	Total:
2008	7,386*	1,235	960	9,581
2009	6,456	6,674	5,067	18,197
2010	4,548	3,891	3,710	12,149
2011	974	1,436	867	3,277
Total:	19,364	13,236	10,604	43,204

*4,684 stations belong to the project Fund for Natural Disasters Prevention (FOPREDEN, Fondo para la Prevención de Desastres Naturales).

2. Photogrammetric Flight and LIDAR

The production was as follows:

Flight type	2008	2009	2010	Total:
Photogrammetric flight	219,954.31 km ²	151,251.99 km ²	22,739 km ²	393,945.30 km ²
LIDAR flight	140,344.96 km ²	131,894.01 km ²	27,628 km ²	299,866.97 km ²



National coverage of LIDAR data

3. LIDAR Data (km²) Point Cloud

In support of the geodetic works for the LIDAR survey, 7,962 cartographic formats 1:10,000 were generated, representing a coverage of 326,372 km².

4. Digital Elevation Models

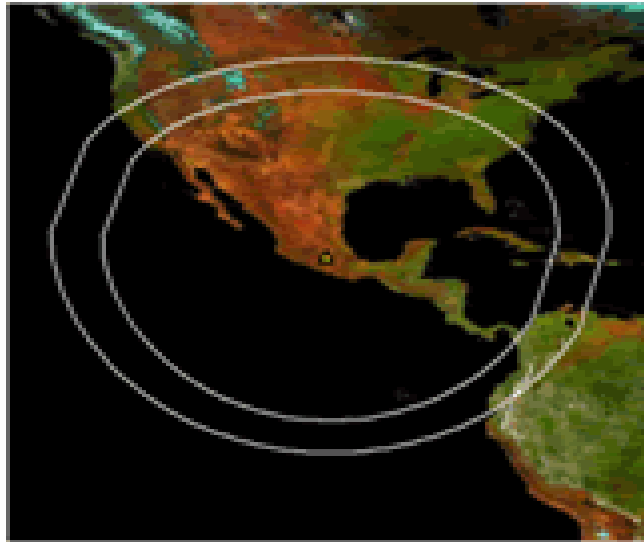
For the South and North Plains of the Gulf of Mexico, Nuevo Leon, Aguascalientes, Sonora, Distrito Federal, Chiapas, Tabasco and Rio Grijalva bed, 15,430 digital elevation models have been generated (7,715 are surface models and the same quantity are terrain models), in cartographic format scale 1:10,000, with a 5 m resolution.

5. Ground Stations (Satellite imagery)

The operations of the ground stations –ERMEXS and ERIS- responsibility of the Institute, are summarized as follows:

INEGI, ERIS information received and processed									
Satellite	Sensor	2008		2009		2010		2011	
		Received	Processed	Received	Processed	Received	Processed	Received	Processed
ERS	LBR	663	663	136	0	716	716	401	401
Landsat 5	TM	300	40	269	56	234	804	134	219
Terra	MODIS	361	343	538	277	555	254	115	138
AQUA	MODIS					76	26	359	121
Total:		1,324	1,046	943	333	1,581	1,800	1,009	879

INEGI, ERMEXS information received and processed									
Satellite	Sensor	2008		2009		2010		2011	
		Received	Processed	Received	Processed	Received	Processed	Received	Processed
Spot	2	28,285	3,243	11,540	10,259	0	26,642	0	0
Spot	4	26,429	3,870	18,129	13,902	18,100	47,475	4,088	3,381
Spot	5	19,317	10,097	16,176	18,739	16,019	51,816	5,575	6,144
Total:		74,031	17,210	45,845	42,900	34,119	125,933	9,663	9,525



ERMEXS Antenna Coverage

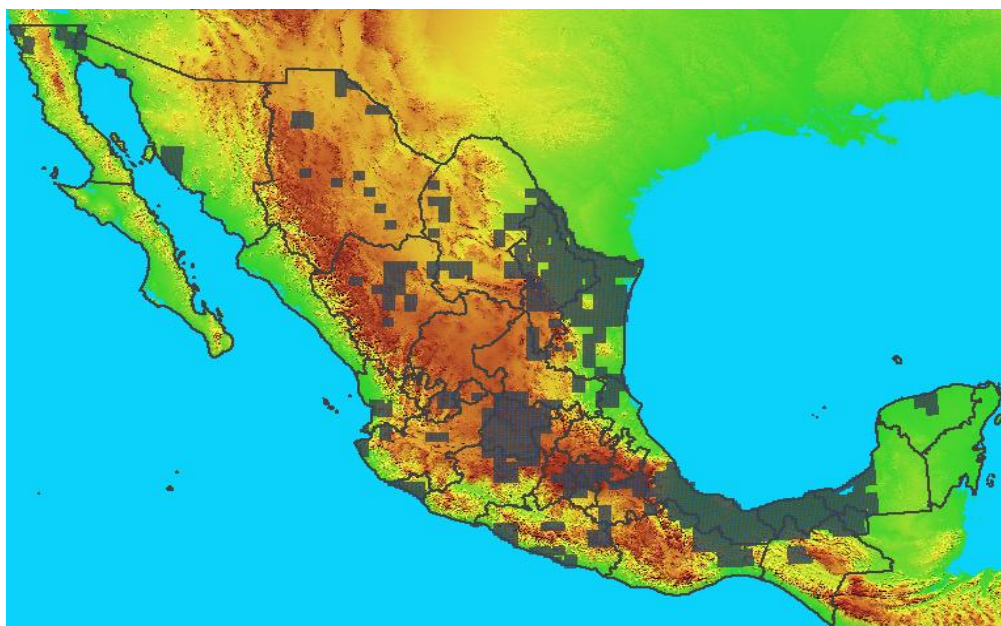
The ERIS station receives the following signals: Landsat 5 TM, providing about 10 images a week; ERS-2 LBR (radar) supplies about 10 images a week, and TERRA-Modis delivers 3-5 images daily.

With respect to the virtual station for the acquisition of the GeoEye1 sensor high resolution images, in December 2010 the Secretariat of the Navy made the required arrangements for the establishment of such station for images capturing, with a 0.5 m space resolution in panchromatic band and 2.0 m in multispectral. The station will probably will be at work in August 2011.

6. Orthophotos

An orthophoto is an image of the terrain, obtained from a photography or a satellite image, that has been orthorectified and transformed and can be used as a map. Its pictorial riches show all the visible features on the earth surface that have not been affected by the processes of generalization nor representation. It has characteristics of a combined photographic image, with the geometric quality of the cartography; for the previous reasons it is appropriate for the elaboration of photomaps, extraction of vector elements and generation of precise urban cartography.

At present, there is an advancement of 13,400 orthophotos with a 1 m resolution. This production corresponds to the physiography of the North and South plains of the Gulf of Mexico, for the states of Nuevo Leon, Puebla, Guanajuato, Colima, Distrito Federal, Jalisco, Hidalgo, Coahuila, Sonora, Zacatecas, Mexico and the northern part of the state of Tamaulipas, as well as higher localities with more than 2,500 inhabitants.



Orthophotos availability Scale 1:10,000

CARTOGRAPHIC PRODUCTION

7. Topographic Cartography

The topographic cartography represents the main highway, communication, hydraulic supply and electrical infrastructures, names and locations of urban and rural localities, orographic and hydrographic features, coastline and urban, and others; compiled with photogrammetric techniques from aerial photographs, geodetic information and field verification.

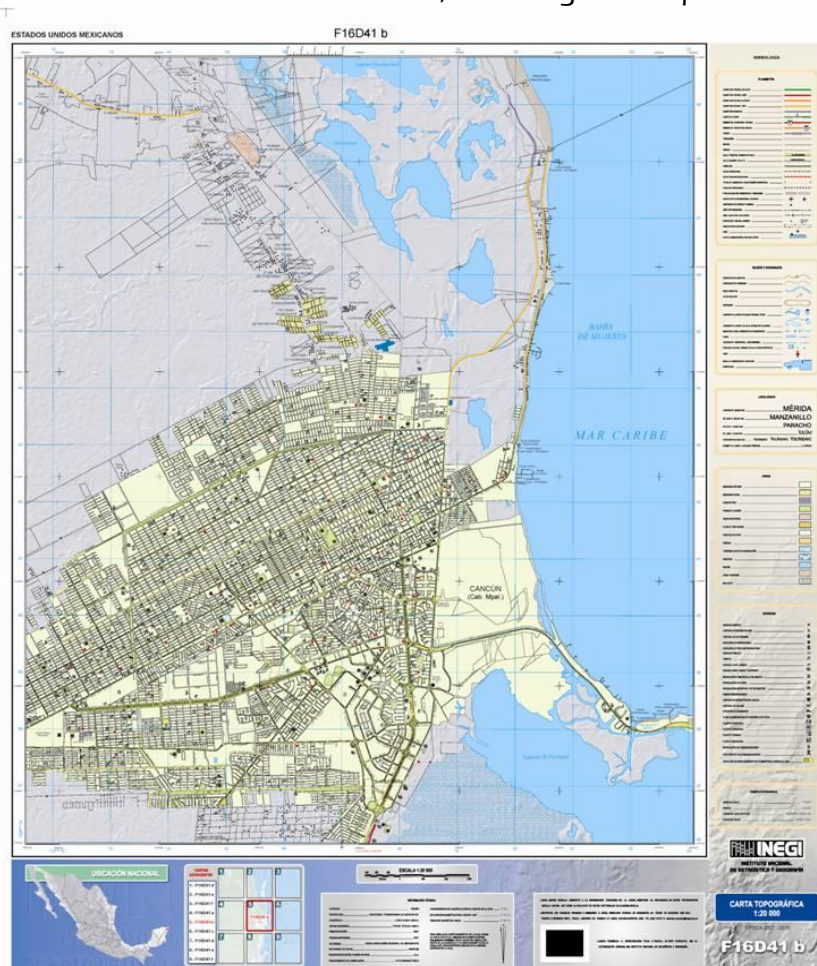
The scales used are:

Scale	Format
1:20,000	Regular format of 7'30" latitude × 6'40" longitude, and a 160 km ² approximate coverage.
1:50,000	Regular format of 15'00" latitude × 20'00" longitude, and a 960 km ² approximate coverage.
1:250,000	Regular format 1° latitude × 2° longitude, and a 23,000 km ² approximate coverage.
1:1,000,000	Eleven formats in different sizes, covering the national territory completely.

From 2008 to 2011, 2,188 maps have been edited in the following scales:

Scale	2008	2009	2010	2011	Total:
1:20,000	182	500	872	310	1,864
1:50,000	92	115	12	25	244
1:1,000,000			10		11
Total:	274	615	894	335	2,118

The scale 1:250,000 edition was concluded in 2008, including 121 maps.



Topographic Map Scale 1:20,000

8. Geostatistical Frame

This frame is a unique and national system for the georeferentiation of statistical information according to the limits established by the Geographic Frame, which correspond to the boundaries determined by the federal and state governments, or in some cases they are similar to those boundaries, and they are acknowledged by these governments within their respective authority.

It divides the national territory in areas with limits identifiable in the field, called "Geostatistical areas" in three levels: State (AGEE, Área geoestadística estatal), Municipality (AGEM, Área geoestadística municipal) and Basic (AGEB, Área geoestadística básica). The AGEB can be urban or rural. This division facilitates the demarcation of states or municipalities, mainly where the political-administrative boundaries are undefined.

Products that make up the Geostatistical Frame:

8.1 Municipality Geostatistical Frame

This frame includes digital files (vector) representing the AGEM, each level with name attributes and geostatistical codes associated respectively, as well as the spatial representation of the urban and rural locality polygons. Urban localities are those with 2,500 inhabitants or more, or the municipality capital city, even with a lower population than the one mentioned; the other localities (complement) are considered as rural localities.

There are two versions: 4.2 and 5.0.

8.1.1 Geostatistical Frame version 4.2

This version integrates 32 AGEES, 2,456 AGEMs and 287,727 rural localities (information obtained from the closing of the 2009 Economic Censuses).

8.1.2 Geostatistical Frame version 5.0

This version integrates 32 AGEES, 2,456 AGEMs, 4,525 urban localities and 187,719 rural localities (information obtained from the planning of the 2010 Housing and Population Census).

8.2 Urban Geostatistical Cartography (Planning and Closing of the 2010 Housing and Population Census)

The 4,204 urban localities with cartography updated to the Closing of 2009 Economic Censuses (first half of the year) are included and also organized by State and subsequently by urban locality.

This cartography is formed by urban locality polygons, AGEBS and blocks, as well as streets and avenues, basic services and main highways.

8.3 Urban Geostatistical Cartography (Closing of the 2010 Housing and Population Census)

In this cartography 4,525 urban localities organized by State and subsequently by urban locality are included.

The cartography contains street names, main service locations and urban AGEB limits with their respective identification codes. Also 4,525 urban localities, 56,195 AGEBS and 1,376,970 blocks are included. About 90% of the 4,525 urban localities is generated from ortophotos, GPS or high resolution images, that is, they are spatially referenced. The other 10% is being processed to obtain the same quality.

8.4 Urban Geostatistical Cartography with Human Settlement Demarcation

Graphic digital representation of the Human Settlement polygon in the urban localities of the country; the group of similar homes built in human settlement areas within a town-planning view are considered. There are several types such as: neighborhood, housing development and residential development.

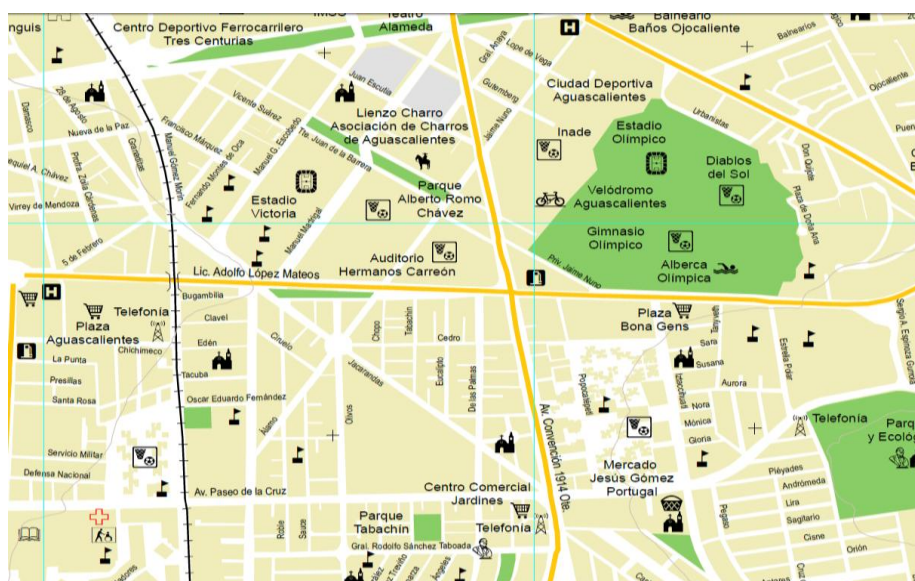
Nowadays, there are 1,929 urban localities with human settling demarcation.

8.5 Digital Urban Cartography

The Direction General of Geography and Environment, INEGI, is developing this project in order to provide updated cartographic information of the last census of housing and population, using georeferenced digital images and showing the location and distribution of urban properties, the existent infrastructure, streets and avenues and services of the State capital cities of the country, including the Federal District (D.F., Distrito Federal) at division level, and those urban localities with more than 100,000 inhabitants. The purpose is to serve the general user interested in locating showplaces and public services, or as a urban locality guide; also to support decision making of civil and private services projects, as well as research and education projects.

Scale	Format
1:10,000	Regular format of 4'30" latitude × 4'45" longitude, and a 58 km ² approximate coverage. The formats vary with the locality size.

From December 2011, the project will have 31 State capital cities and the Cuauhtémoc division of the Federal District. A universe of 150 localities has been considered to be worked.



Digital Urban Cartography

9. Boundaries

9.1 State Political-Administrative Boundaries

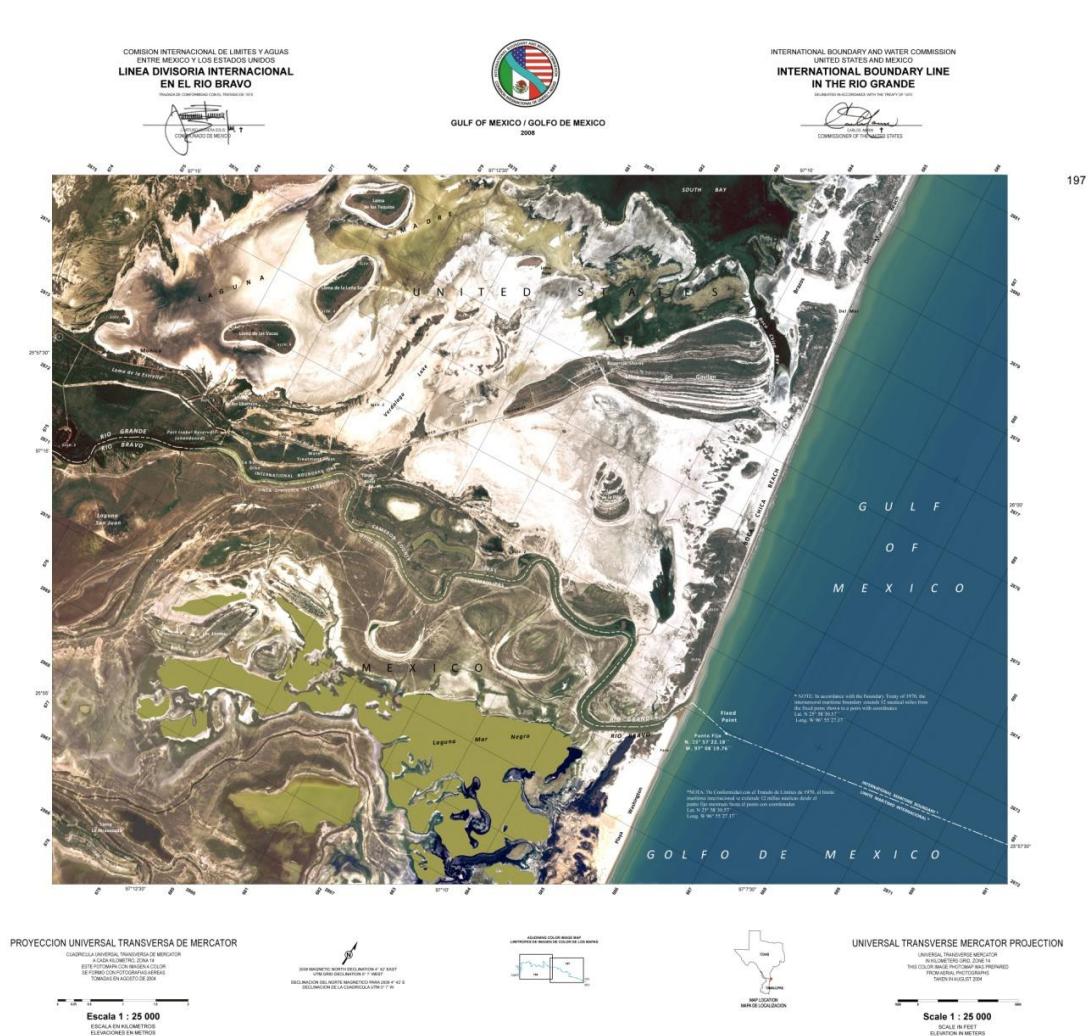
With respect to the territory, the cartographic representations are fundamental elements for the definition of administrative boundaries. In this context, and according to its powers, since 2001, the INEGI has been compiling legal evidences that support the signaling of geographic boundaries between the States, and then continue with the representation of this information in cartographic documents.

From 2008 to 2011 the advancements are:

First, the information obtained was integrated in the product Atlas of the Territorial Division. Afterwards, a selection of legal evidences was performed, which was transcribed into a cartographic base and 32 atlases with information of the inter-municipality political-administrative division by State were generated.

9.2 International Boundaries

Due to the inter-institutional agreement between the INEGI and the Mexican Section of the International Boundary and Water Commission, in 2009 the aerophotographic mosaic of the international boundary demarcation between Mexico and United States, in the area of the Rio Grande, was produced. Composed by 112 orthophotomaps scale 1:25,000, this mosaic represents the international boundary along the City of Juarez, Chihuahua and the Gulf of Mexico, based on the "Treaty to resolved pending boundary differences ..." signed in Mexico City on November 23, 1970.



Map of the International Boundary on the Rio Grande

10. Cadastre Information

10.1 BANOBRAS¹

The **Program for the Cadastre Modernization** is jointly performed to support the municipality cadastres. The main objectives are to promote the development of the municipality geographic information systems, generate reliable information for the development and land administration municipality plan, and increase the municipality incomes. By December 31, 2009, the application and elaboration of the diagnosis and action plan for 48 municipalities were performed, as well as 17 executive projects, giving service to 35 municipalities.

10.2 INDAABIN²

This program consists on performing topographic surveys of federal property buildings and producing their respective plans. From 2007 to 2010, 877 properties were surveyed and 17,775 federal properties were georeferenced.

Year	Properties surveyed	Federal Properties Georeferenced
2007-2008	541	0
2009	110	2,500
2010	226	15,255

10.3 ASERCA3-SIAP⁴-INEGI

Within the agreement for the “Updating of Data and Files Directory of the Program for Direct Support to the Field (PROCAMPO)”, 724,656 properties have been georeferenced and 422,185 owners have been served during the period 2009-2010.

¹ **National Bank of Public Works and Services.** Development bank classified as a public corporation with majority State participation, of which aim is to finance or re-finance public or private investment projects for infrastructure and public services, as well as to contribute to the institutional strengthening of the federal, state and municipality governments.

² **Institute of National Properties Management and Valuation.** It is a deconcentrated agency of the Secretariat of the Civil Service, of which aim is to provide property, valuation, legal, regulatory and registration services to the Public Administration, collaborating to the social and economic development of Mexico.

³ **Support and Services to the Agricultural and Livestock Marketing.** Administrative deconcentrated agency of the Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA, Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación), of which aim is to design, implement, follow up on and evaluate the public policies on support to the Field included in the National Development Plan, as well as in the mid-term Sector Program, in order to strengthen the sector development, agriculture profitability and national producers income.

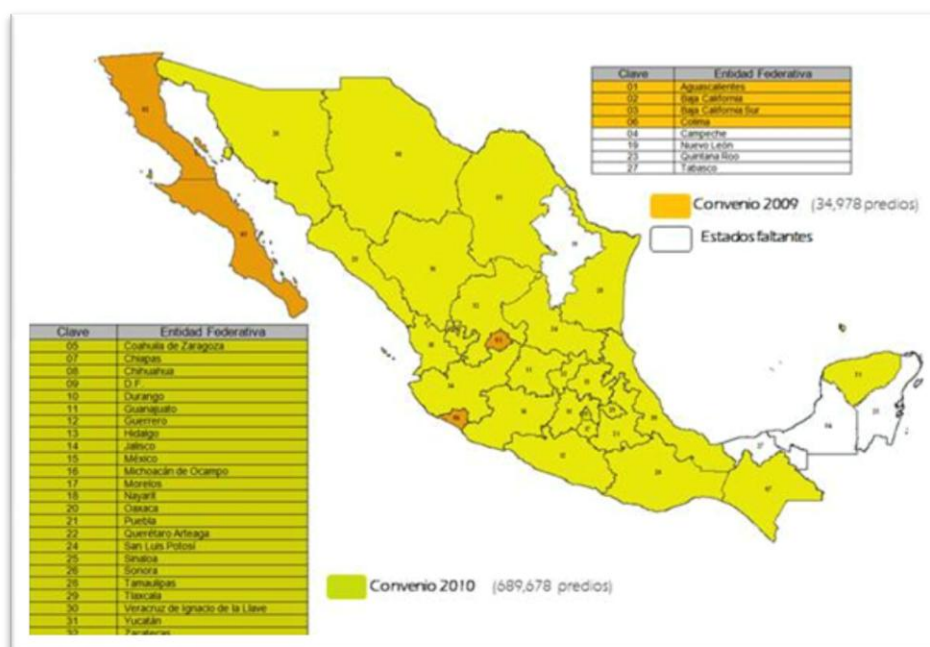
⁴ **Agrifood and Fishery Information Service.** Deconcentrated agency of the SAGARPA, in charge of the design and coordination of the National Information System of the Agrifood and Fishery sector, as well as the fostering of the attendance and coordination for the implementation of the Information National System for Rural Sustainable Development.



Data and Dossier updating of
PROCAMPO Directory

Advancement per Agreement:

Agreement 2009	Agreement 2010
34,978 georeferenced properties of 25,222 owners in 4 States.	689,678 georeferenced properties of 396,963 owners in 28 States.



Advancement from 2009 to 2010

11. Natural Resources

There is a great diversity and richness of natural resources in the country. This diversity is due to its complex topography and geology, as well as to historical-evolutionary aspects.

Today, the Direction General of Geography and Environment has generated cartographic information about edaphology, land use, potential land use, hydrology and climatology, described as follows:

Map	Description
Edaphologic Map	This cartography represents the morphological, physical and chemical characteristics of the national soils. It is considered as a reference frame for ecological disasters and environmental degradation prevention, caused by soil overexploitation or inadequate use. This theme has the national coverage corresponding to the Series II ⁵ distributed in 153 sets up to 2009.
Surface Hydrology Map	This map contains Information of the hydrologic basins of the country: hydrographic network, hydrometric station, dams and body water location, signaling the use given to this resources, and the irrigation districts location supplied by the surface exploitation. The Series III is in process.
Groundwater Hydrology Map	The map provides information about the probable existence of groundwater aquifers, inferred from the characteristics of the lithological material and the terrain configuration; it also indicates well, waterwheel and aeroengines location with phreatic levels (depth to the water); the quantity of water being extracted and its use; thermal springs location with water temperature; thermoelectrical facilities locations, and irrigation districts supplied by groundwater exploitation. The Series III is being produced.
Land Use and Vegetation Map	This map shows the distribution of the natural vegetation variety, as well as the level and kind of vegetal community damage and its dynamic in Mexico; besides it allows to learn about the location of agriculture areas along with their water availability and cultivation stay in the field. The distribution of the vegetal cover and different land uses are represented at all scales according to the INEGI Vegetation Classification System. The series V is in process.

Map	Description
Potential Land Use Map	<p>The map describes the environmental condition set for a better soil and resources exploitation for the agriculture, livestock, forestry and urban development.</p> <p>There are 107 maps produced and 32 printed according to the 1982 methodology; as well, the corresponding processes to apply 2010 methodology have begun. There is an advancement of 7 sets concluded and 5 in process.</p>
Climate Cartography	<p>This map provides information about the climate characteristics for the national territory.</p> <p>It includes the same reference frames as the topographic map. In the series 1:500,000 all the climates of the country are shown.</p> <p>The Series 1:1,000,000 is composed of three climate maps, including the cartographic expression of the drought, that is, the period of the rain season when the rainfall decreases, and the records of the meteorological stations referring to the temperature are established.</p>



Thematic Cartography

⁵Series: Set of maps that have a continuity in data and theme.

The advancements in the above mentioned maps are shown in the following table:

Project	Scale	2008	2009	2010	2011
Edaphology Series II	1:250,000	63	8		
Surface Hydrology Series II	1: 250,000	9	8	17	17 (60%)
Groundwater Hydrology Series II	1: 250,000	11	6		
Groundwater Hydrology Series III	1: 250,000	1	9	16	9 (40%)
Land Use and Vegetation	1:50,000			220	129 (34%)
Land Use and Vegetation Series IV	1:250,000	57	148		
Potential Land Use	1:250,000			6	5 (25%)
Climate Information	1:1,000,000	2	6		1(60%)
Geology Series I	1: 50,000	17	22	53	60 (30%)
Geology Series II	1: 50,000			18	5
Information Generation Scale 1:250,000 Erosion	1: 250,000			34	40 (35%)
Bathymetry	1:1,000,000	3	2	2	1(40%)
EEZ Bathymetry	1:1,000,000		2	1	

12. State Summaries

The summaries integrate information of infrastructure, orography, hydrography and towns of the country; produced from the topographic map scale 1:250,000.

Heights are represented in colors and the orographic features are shaded in the terrain. Hydrological, civil works, land, aerial and maritime communication routes, and towns information is included. Now, the product has been completely finished for the 32 States, in scales that vary for each state from 1:80,000 to 1:250,000.

13. Map of the Mexican Republic

This map represents heights and orographic features; includes hydrological, civil works, land, aerial and maritime communication routes information, feasible to be represented according to the map scale. In some scales the sea demarcation is shown.



Map of the Mexican Republic

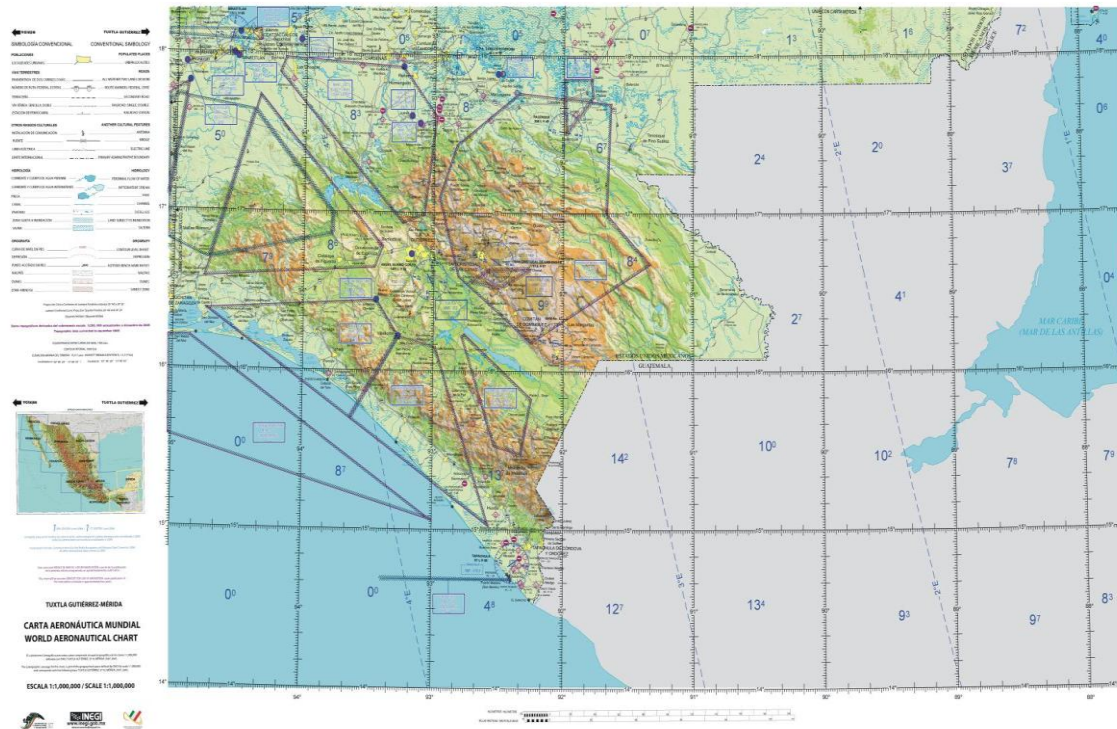
14. Aeronautical Chart

The chart provides information that complies with the need of aerial visual navigation in flights at low speed, short and medium distances and low and medium altitudes.

The aeronautical chart 1:1,000,000 is available in a six-chart series with information on both sides, covering all the territory.

The information is provided by the Mexican Airspace Navigation Services, Direction General of Civil Aeronautics, Labor Union Association of Aviators and Direction General of Merchant Navy, through the Direction General of Planning, Secretary of Communications and Transport.

The Secretary of National Defense provides the information about militar aerodromes and restricted zones for commercial flights.



World Aeronautical Chart Scale 1:1,000,000

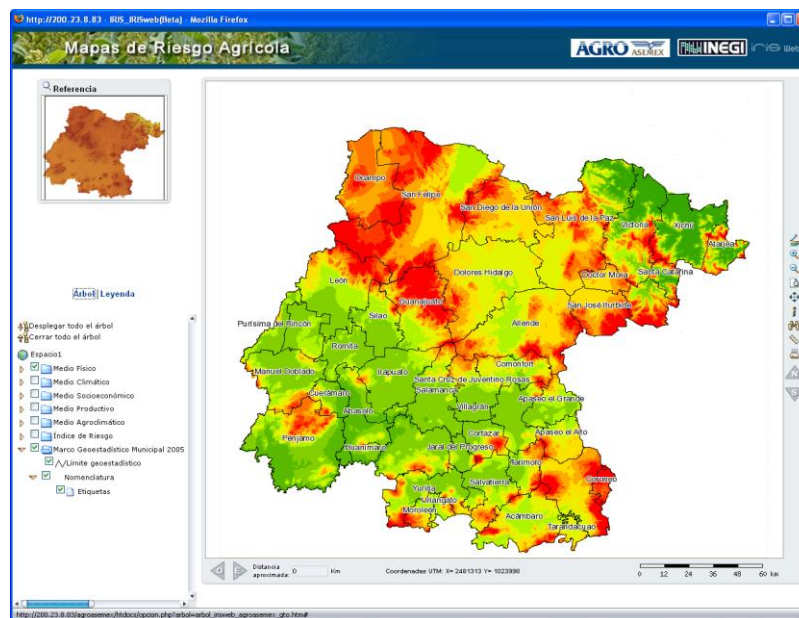
OTHER PRODUCTS

15. Geomatic Solutions

During the period 2008-2011, the following applications have been generated:

15.1 IRIS WEB AGROASEMEX version 1.0

Information System at Internet about Agriculture Risks that allows to know graphically the probability of a loss associated to climate threats, through query tools and information analysis. The information included in the system offers analysis elements to the participants of the agriculture sector and shows information at municipality level divided into different themes: physical, climate, socio-economic and productive environments, and risk indexes.



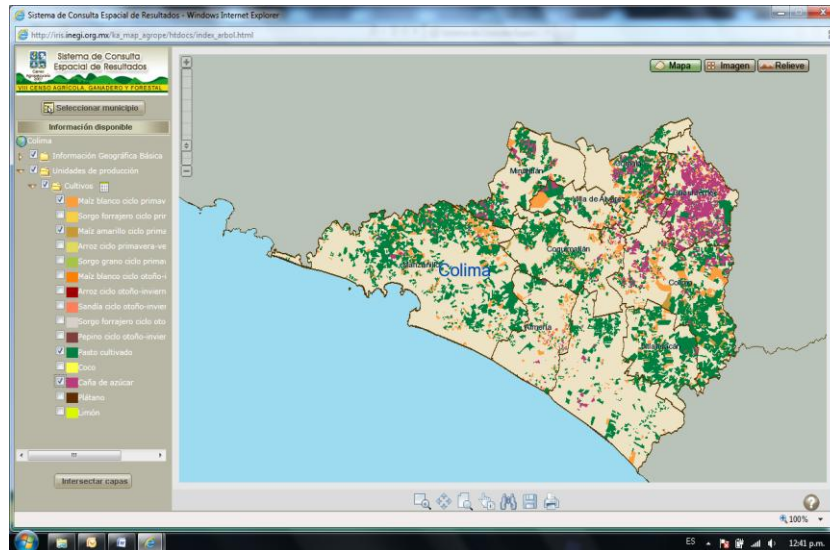
IRIS WEB AGROASEMEX version 1.0 (Agriculture Risk Map)

15.2 Belize Cartography for the Censuses

Project requested by the Statistical Institute of Belize (SIB) for the digital extraction of the cartographic information from orthorectified satellite images using an application of a geographic information system. The cartography delivered was used as support for the activities of planning, implementation, processing and dissemination of the Belize 2010 Housing and Population Census results. It contains polygon-like cartography: Locality polygons, enumeration districts, blocks, homes, water bodies; line-like cartography: Coastlines, street centerlines, highways, roads, ways. Point-like cartography (docks and bridges). It was prepared for the urban areas of Belize, Benque Viejo, Corozal, Dangringa, Orange Walk, Punta Gorda, Santa Elena, San Ignacio and San Pedro, and the rural areas of the districts Corozal, Orange, Belize, Cayo, Stann Creek and Toledo.

15.3 Spatial Query System for the VIII Agriculture, Livestock and Forestry Census Results

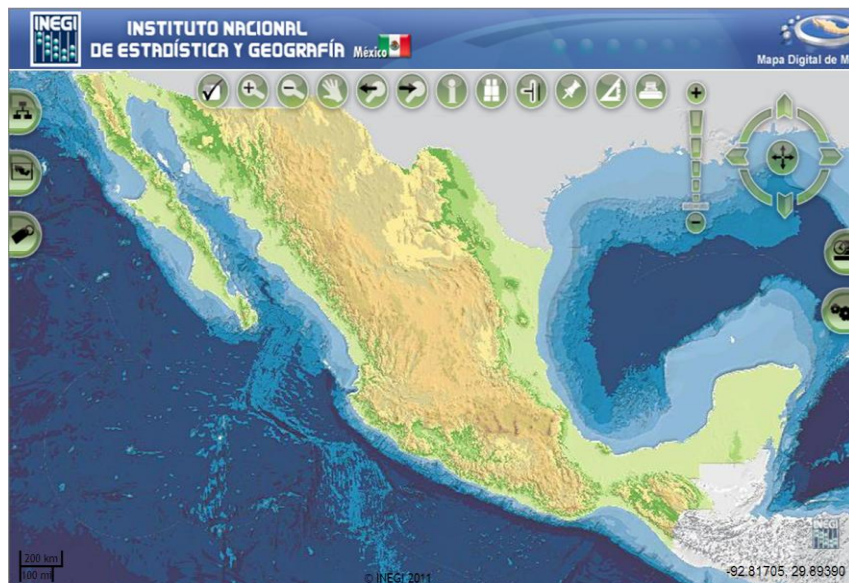
This system is used as a means for the dissemination of Census data. It is organized in 32 projects, one per State and contains query and information analysis tools. It is widely used by several sectors of the society; it allows to know the data captured by the Institute during the Census, as well as the analysis information in order to support decision making. The system has statistical and geographic information derived from the 2007 Agriculture, Livestock and Forestry Census which covers diverse themes such as tenancy type, agriculture, livestock and forestry activity, water availability, technologies, equipment, etc., as well as environmental aspects, urban and rural localities and communications and transport infrastructure.



Spatial Query System for the VIII Agriculture, Livestock and Forestry Census Results

15.4 Implementation of the Digital Map of Mexico version 5.0

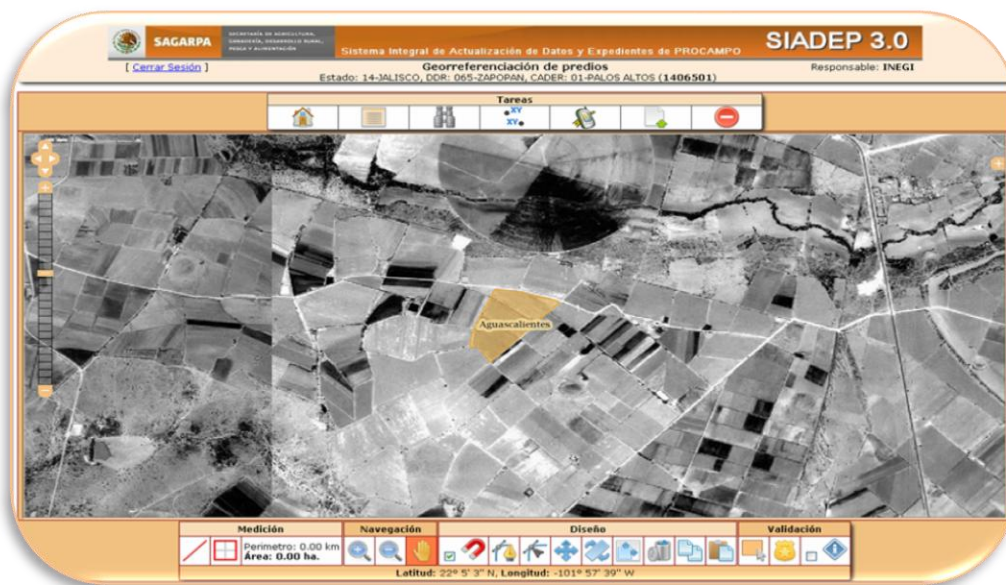
Web geographic information system with capacities such as simple visualization of geographic layers to spatial analysis, it can also be used as a platform to generate solutions that combine geographic and statistical data. It contains the following layers: topographic information, natural resources, geostatistical frame to the block level, social property cadastre, geodetic network and orthophotos, among others; besides it allows to associate statistical information to geographic objects of the geostatistical frame.



Digital Map of Mexico

15.5 Development, Implementation and Maintenance of the Integral System for the Updating of PROCAMPO Dossiers

The INEGI is participating in an agreement with ASERCA, of which activities consist on the development of the different modules of the Integral System for the Updating of the PROCAMPO Dossiers. This system works on a web platform over a server for each Support Center for the Rural Development of SAGARPA⁶. The system contains property data records supported and updated by PROCAMPO; digital dossiers with the files produced by the digitation of the documents delivered by the owners, as well as the approximate property georeference, geographic and topographic layers, and also layers from the Program for the Certification of Rural Property Rights and Entitlement of Urban lots.



Integral System for the Updating of PROCAMPO Documents and Dossiers

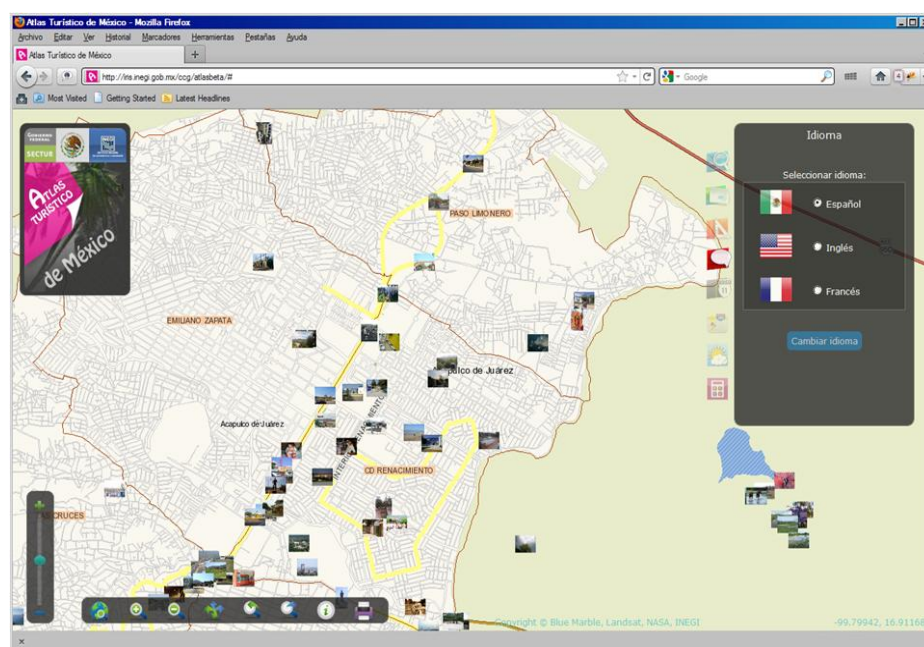
15.6 Hydrographic Network obtained from Topographic Vector Data scale 1:50,000

This network provides vector information with the topology of geometric networks with two classification methods of the flow lines according to their hydromorphometry, also included the capture units of the digitized surface waters and the corresponding with the same scales of the network, to be used in diverse projects related to the study of hydrographic basins. It contains flow lines, drainage points and sub-basin polygons that model the surface runoffs.

⁶ **Secretary of Agriculture, Livestock, Rural Development, Fisheries and Food.** Agency of the Federal Executive Power of which objectives are the practice of a support policy that allow a better production, make the most of comparative advantages of our agricultural and livestock sector, integrate the rural environment activities to the productive chains of the rest of the economy and encourage the collaboration of the producer organizations with programs and projects of their own, as well as the goals and objectives proposed for the sector within the National Development Plan.

15.7 Tourist Atlas of Mexico

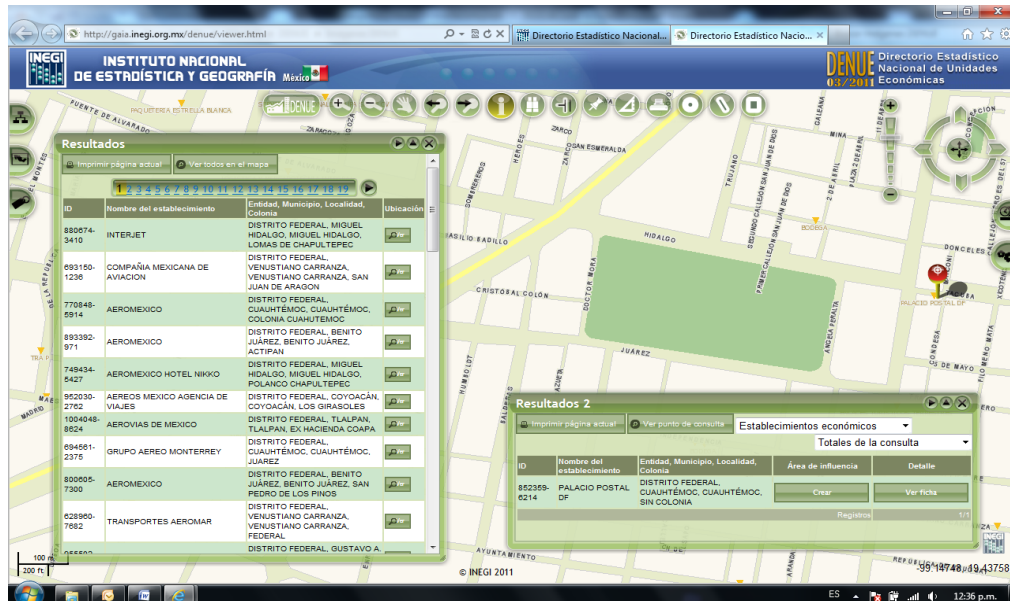
This is a software application developed in a web platform for tourism promotion in Mexico to help the user to find the sites of tourist interest, with basic information to go from one site to another; also navigation of maps with zooming in and out, up-down-right-left displacements, relevant guiding data and other information about the elements provided by the system. It counts with the 2009 national, state and municipality geostatistical frame; 2009 territorial integration; 2009 locality limits and blocks; street, sites and magic towns names; tourist, archeological and economic zones; communication infrastructure and hydrography scale 1:50,000; all the Mexico tourist units with H (National Program of Hygienic Food Handling) and M (Program of Quality Modernizes) symbols; Micro, Small and Medium Companies (MIPYMES, Micro, Pequeñas y Medianas Empresas); Tourist MIPYMES; "Tourism for Business Meetings"; the 10 tourist routes of Mexico, and nautical, sport, cultural, health and nature Tourism.



Tourist Atlas of Mexico

15.8 National Statistical Directory of Economic Units (DENUE)

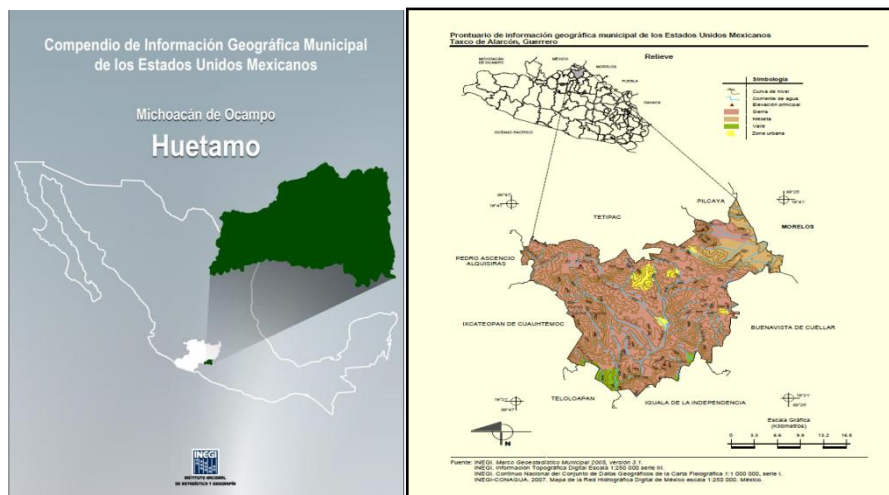
Web query system based on the Digital Map of Mexico that allows to learn about more than 4.3 millions of economic units georeferenced all along the national territory and grouped by economic activity with respect to the North American Industry Classification System (NAICS). This tool allows to select economic units by geographic area, size according to the staff hired, economic activity and particular characteristics.



National Statistical Directory of Economic Units

15.9 Municipality Geographic Information Compendia

Digital publication of which general objective is to integrate and disseminate the relevant information about natural resources and environment, transport infrastructure and geographic location of 2,456 Mexican municipalities and their localities. Available for free download at the INEGI website.



Municipality Geographic Information Compendium of the State of Michoacán de Ocampo

16. Geographic Indicators

Due to the commitments established by the LSNIEG, 19 indicator proposals aligned with the Millenium Development Goals were elaborated.

- Coastal aquifer with saline intrusion.
- Prohibited areas for the free extraction of groundwater with respect to the total surface of the territory.
- Concessioned volume for consumptive use.
- Wastewater treatment.
- Degree of pressure on hydrological resources.
- Intensity of groundwater use (IUAS, Intensidad de uso del agua subterránea).
- Water quality.
- Surface affected by soil degradation in Mexico.
- Remaining natural vegetation surface change per main vegetation types.
- Protected and under sustainable management surface.
- Surface under forestry management.
- Consumption of ozone depleting substances.
- Air quality: days when the standard values are exceeded.
- Air quality: air quality monitoring in metropolitan zones or relevant cities.
- Emissions of greenhouse gases.
- Proportion of species in danger of extinction.
- Hazardous waste handling: installed capacity authorized.
- Urban solid waste uncontrolled disposition (RSUSC, Residuos sólidos urbanos dispuestos sin control).
- Coastal municipality population in the analysis process for approval.

17. Regulations

Within the SNIEG context and as one of the Direction General of Geography and Environment commitments with respect to geographic and environmental technical regulations, 28 technical standards have been updated; the following standards are already published in the Official Journal of the Federation (DOF, Diario Oficial de la Federación): Technical Standard for the National Geodetic System, Technical Standard for the Geographic Metadata Generation, Technical Standard for the Positioning Accuracy Standards and Technical Standard on Geographic Addresses.

18. National Registry of Geographical Information (RNIG)

With the enactment of the LSNIEG, the activities for coordinating the production of information of national interest and consolidating the RNIG have been strengthened, where the INEGI is the coordinator of the System and operator of the National Registries.

The RNIG objective is to document, register and spread the existent geographic information of national interest in order to rule its generation, as well as to strengthen its safeguard and availability. The RNIG has three main components: 1° The Units of the State that are in charge of developing geographic activities; 2° Data, data groups and products generated by the Units of the State, and 3° Data, Dataset and Product attributes.

The information included in the RNIG comes from the metadata mainly, some of the advancements achieved may be found at the INEGI website.

19. Strategic Alliances

The INEGI has fortified its participation in international forums joining as a member in the following international organizations:

- International Cartographic Association (ICA)
- International Society for Photogrammetry and Remote Sensing (ISPRS)
- United Nations Regional Cartographic Conference for the Americas (UNRCCA)
- Permanent Committee for Geospatial Data Infrastructure of the Americas (CP-IDEA)
- International Federation of Surveyors (FIG)

As well, we continue collaborating with the following international organizations:

- European Committee Responsible for Official Cartography Agencies (CERCO)
- Pan American Institute of Geography and History (PAIGH)
- United Nations Program for Environment (UNEP)
- International Steering Committee for Global Mapping (ISCGM)

Groups of Experts:

- Working Group on Environmental Statistics of the Statistical Conference of the Americas (CEA-CEPAL)
- Oslo Group on Energy Statistics of the United Nations (Oslo Group)
- United Nations Group of Experts on Geographical Names (UNGEGN)
- Group of Experts on Global Geospatial Information Management (in the making)

20. International Agreements

These are the current international agreements:

- PUBLIC CARTOGRAPHIC COMPANY OF THE CANARIES (GRAFCAN)
- NATIONAL GEOGRAPHIC INSTITUTE, FRANCE (IGN)

- UNITED STATES GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR (USGS)
- LATIN AMERICAN INSTITUTE OF THE EDUCATIONAL COMMUNICATION (ILCE)
- NATIONAL INSTITUTE OF STATISTICS OF GUATEMALA (INE)
- NEW BRUNSWICK UNIVERSITY, CANADA
- NORTH AMERICAN CENTER OF ENVIRONMENTAL INFORMATION AND COMMUNICATION, MEXICO
- GOVERNMENT OF THE REPUBLIC OF GUATEMALA