ASU Library
Arizona State University

Map and Geospatial Hub

Visualizing Geospatial Data with GIS Software Tools

Visualización de Datos Geoespaciales con Herramientas de SIG

Matthew Toro
Matthew.Toro@asu.edu

2017 / 09 / 04

Entre pares
Publicar y navegar en redes de la información científica

UACJ

CONRICyT
Consorcio Nacional de Recursos de Información Científica y Tecnológica

What do we need? 1

¿Que necesitamos? 1

- **Software**

What do We Need? 2

¿Que necesitamos? 2

- **Data** *Datos*
  - Vector Data *Datos Verticales*
  - Raster Data *Datos Raster*
  - Tabular Data *Datos Tabulares*

We will demonstrate the process for collecting these data, but these data should be made available during the workshop session.

Demostramos el proceso para recolectar estos datos, pero estos datos deben estar disponibles durante la sesión del taller.

Software Installation

Instalación de Software

Descarga QGIS para tu plataforma

La versión actual es QGIS 2.18.12 'Las Palmas' y fue lanzada en 18.08.2017.

QGIS está desponible para Windows, MacOS X, Linux y Android.

Los paquetes binarios(instaladores) para versión estable actual 2.18 puede ser descargado aquí.

DESCARGAS DE INSTALACIÓN | TODOS LOS LANZAMIENTOS | FUENTES

Descarga para Windows

Último lanzamiento (eg. para Nuevos Usuarios):

- Instalador autónomo de QGIS Version 2.18 (32 bit) — md5
- Instalador autónomo de QGIS Version 2.18 (64 bit) — md5

Long term release repository (eg. for corporate users):

- Instalador autónomo de QGIS Version 2.14 (32 bit) — md5
- Instalador autónomo de QGIS Version 2.14 (64 bit) — md5

Para Usuarios Avanzados:

- OSGeo4W Instalador en red (32 bit)
- OSGeo4W Instalador en red (64 bit)

En el instalador escoge **Instalación rápida de Escritorio** y selecciona **QGIS** para instalar el lanzamiento más reciente.

Para obtener el lanzamiento de largo plazo elija **Instalación Avanzada** y seleccione **qgis-ltr-full**

While we're taking care of that . . .

Mientras cuidamos de eso. . .

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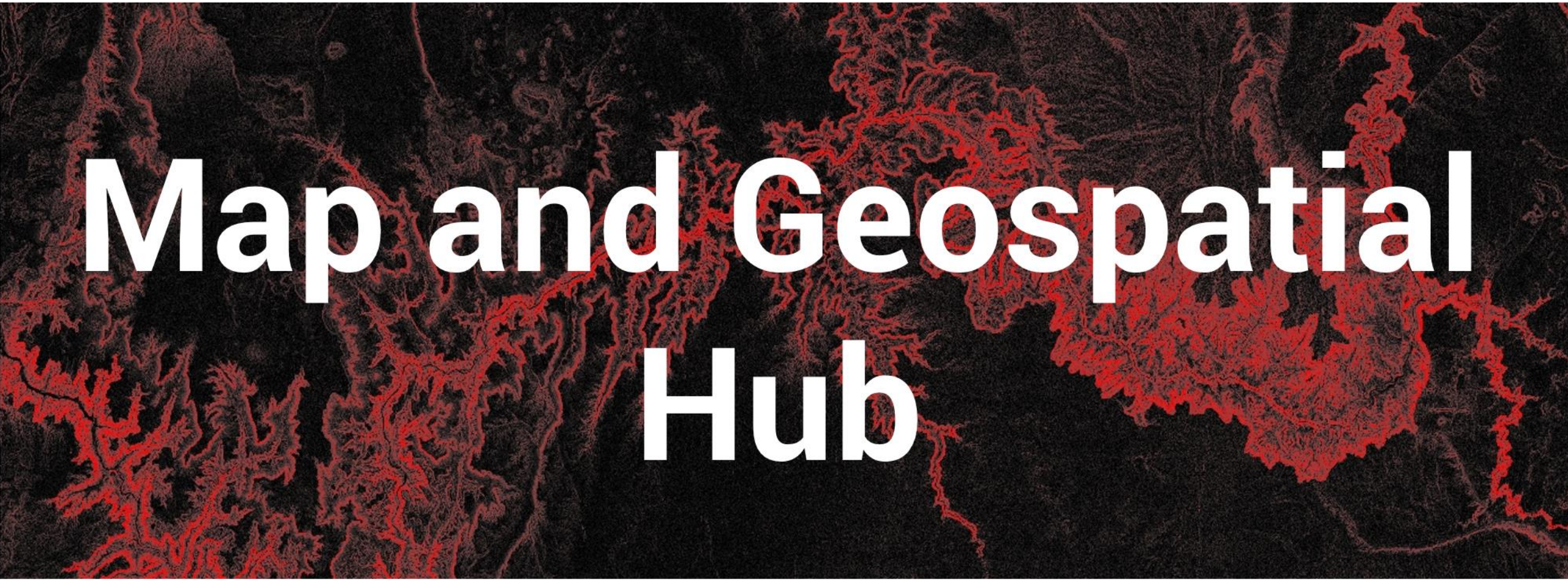
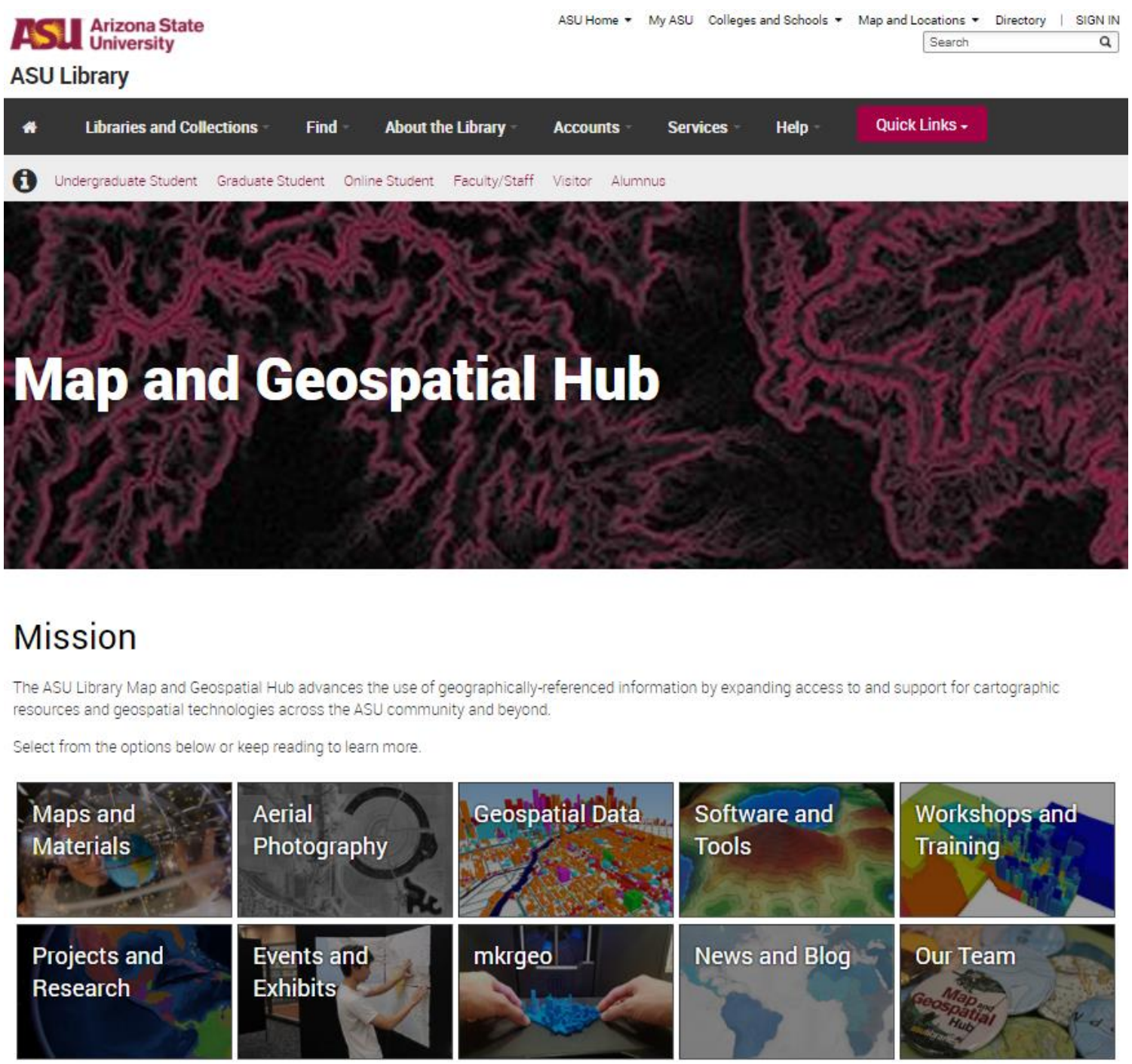


lib.asu.edu/geo



- Maps
- *Mapas*

- Aerial Photography
- *Fotografía Aérea*

- Satellite Imagery
- *Imagines Satélites*

- Geospatial Data
- *Datos Geoespaciales*

- Software & Hardware

- Workshops & Training
- *Talleres y Entrenamiento*

- Research Projects
- *Proyectos de Investigación*

- Events and & Exhibits
- *Eventos & Exhibiciones*

Workshop Goals

- Understand the meaning and applications of GIS and geospatial data
- Gain familiarity with the user interface and basic functionality of a free, open source GIS software platform: QGIS
- Learn the two major methods for modelling geographic reality in a simulated computer environment
- Explore the variety of geospatial data and geospatial data sources
- Identify common applications of geospatial data visualization
- Perform common GIS queries and data management techniques
- Integrate datasets from disparate sources
- Visualize geospatial data in 2D and 3D

Objetivos del taller

- *Comprender el significado y las aplicaciones de los SIG y los datos geoespaciales*
- *Familiarícese con la interfaz de usuario y la funcionalidad básica de una plataforma de software GIS de código abierto y libre: QGIS*
- *Aprenda los dos métodos principales para modelar la realidad geográfica en un entorno de computadora simulado*
- *Explore la variedad de datos geoespaciales y fuentes de datos geoespaciales*
- *Identificar aplicaciones comunes de visualización de datos geoespaciales*
- *Realizar consultas comunes de SIG y técnicas de gestión de datos*
- *Integrar conjuntos de datos de fuentes dispares*
- *Visualizar datos geoespaciales en 2D y 3D*

What is a GIS?

¿Qué es un SIG?

A geographic information system (GIS) integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of **geographically referenced information**.

El SIG (sistema de información geográfica) integra 'hardware', 'software' y datos para capturar, manejar, analizar y presentar todas las formas de información referenciadas geográficamente.

GIS allows us to view, understand, question, interpret, and visualize data in many ways that reveal relationships, patterns, and trends in the form of **maps**, **globes**, **reports**, **charts**, and other types of **geo-visualizations**.

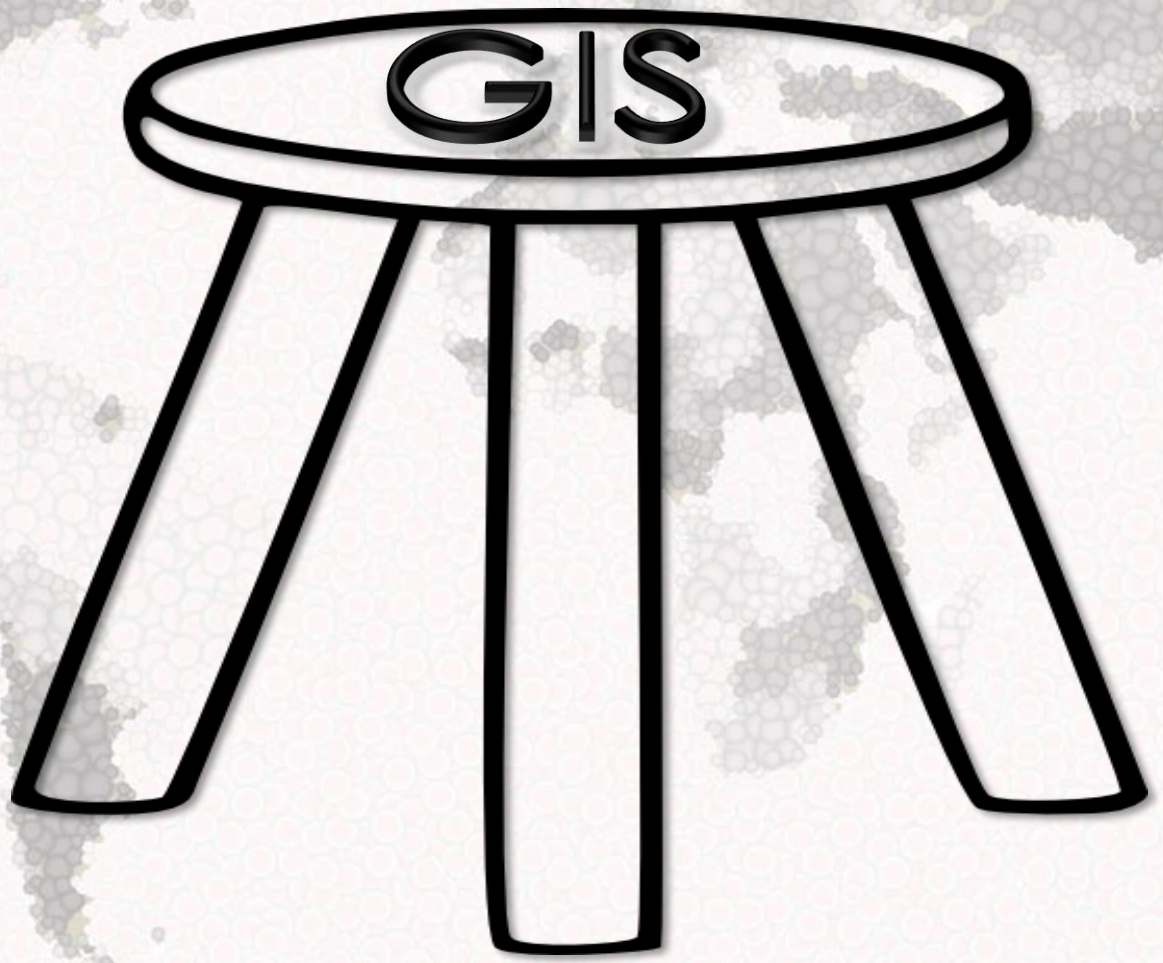
El SIG nos permite ver, cuestionar y visualizar datos en formas que revelan relaciones, patrones y tendencias en forma de mapas, globos, reportes y otros tipos de geo-visualizaciones.

A GIS helps you answer questions and solve problems by looking at your data in a way that is **quickly understood** and **easily shared**.

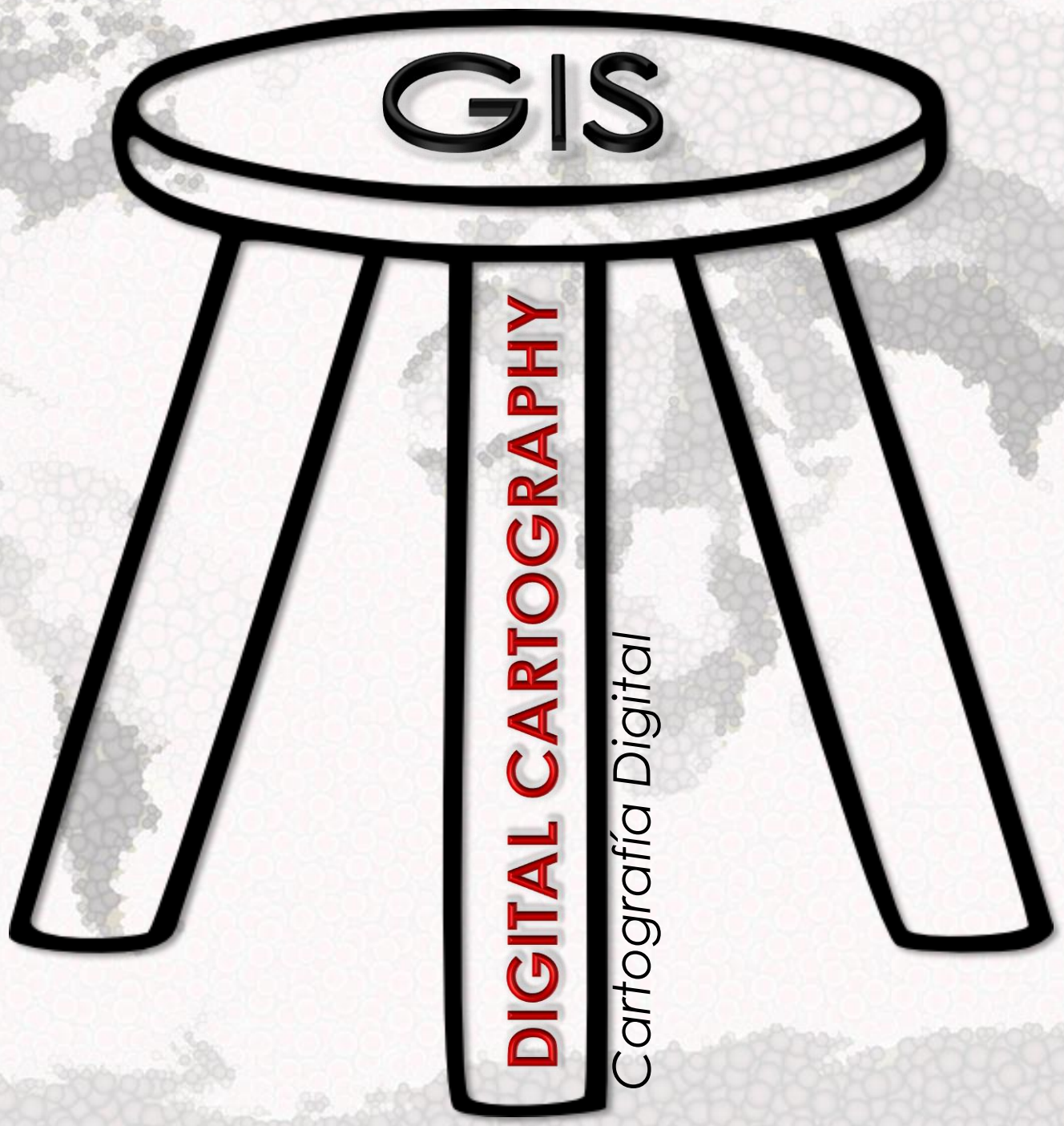
El SIG le facilita dar respuesta a preguntas y solventar problemas al mirar los datos de una forma fácil de comprender y compartir.

Source: adopted from ESRI, www.esri.com

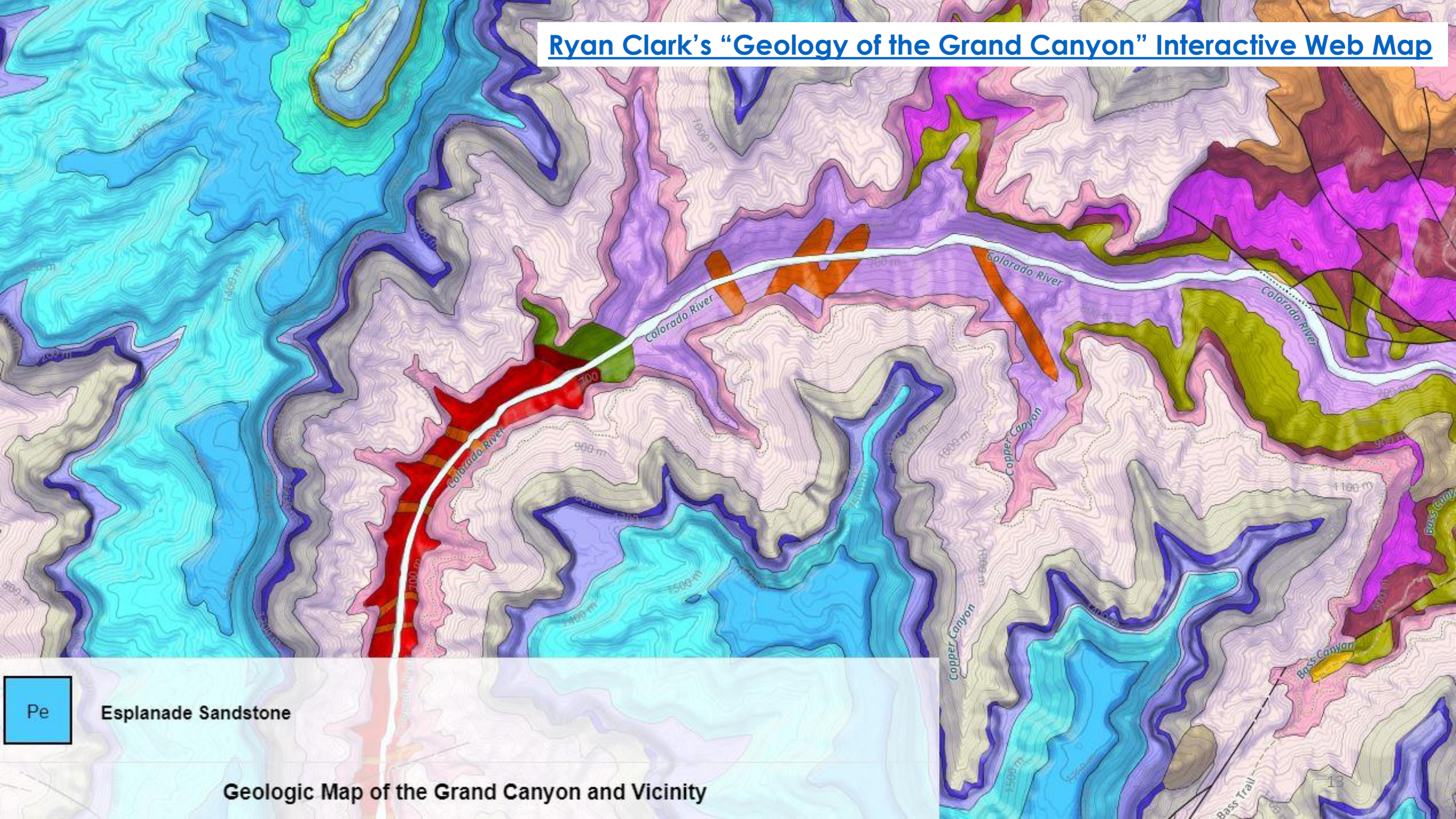
GIS is like a three-legged stool . . .

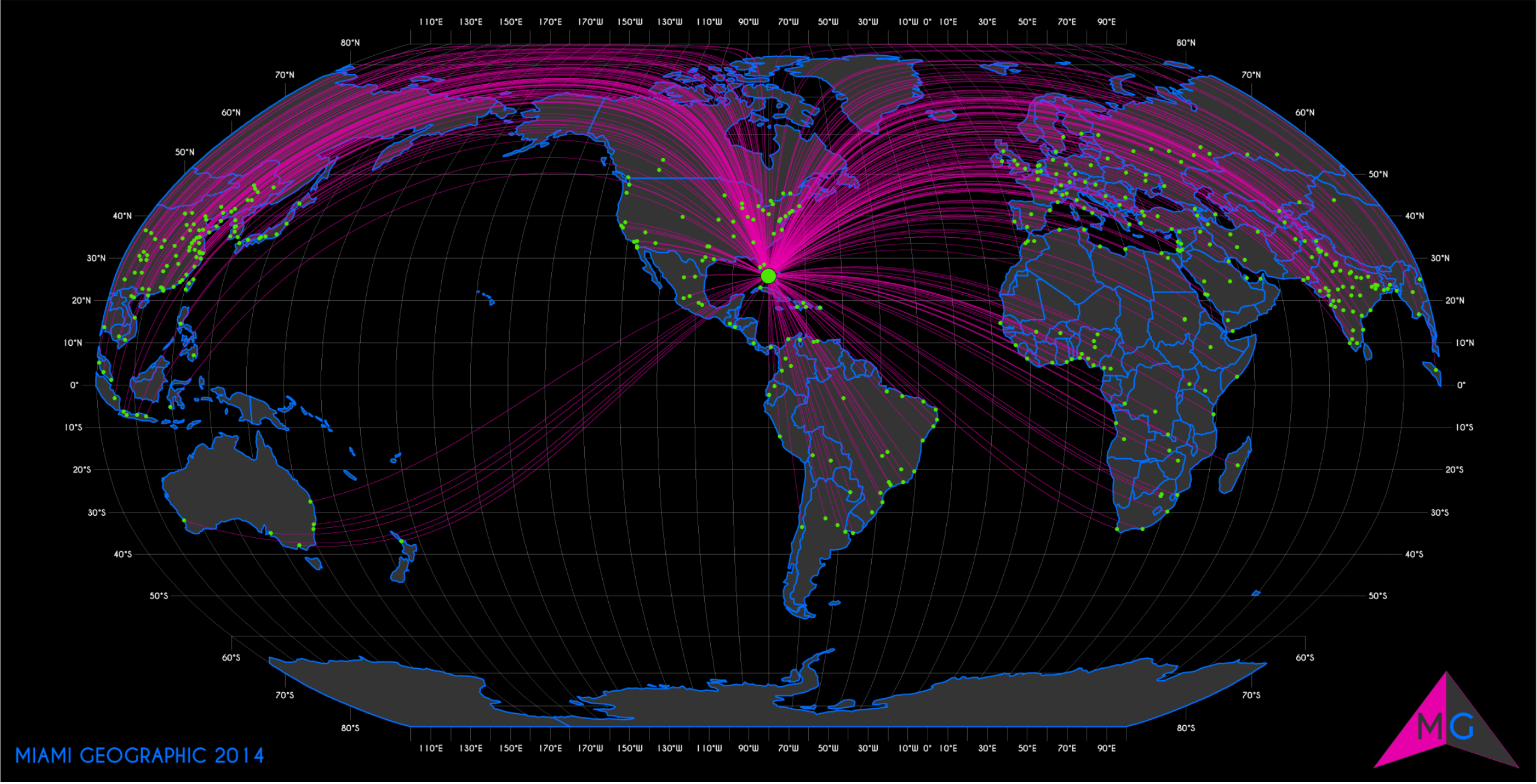


El SIG es como un taburete de tres patas. . .

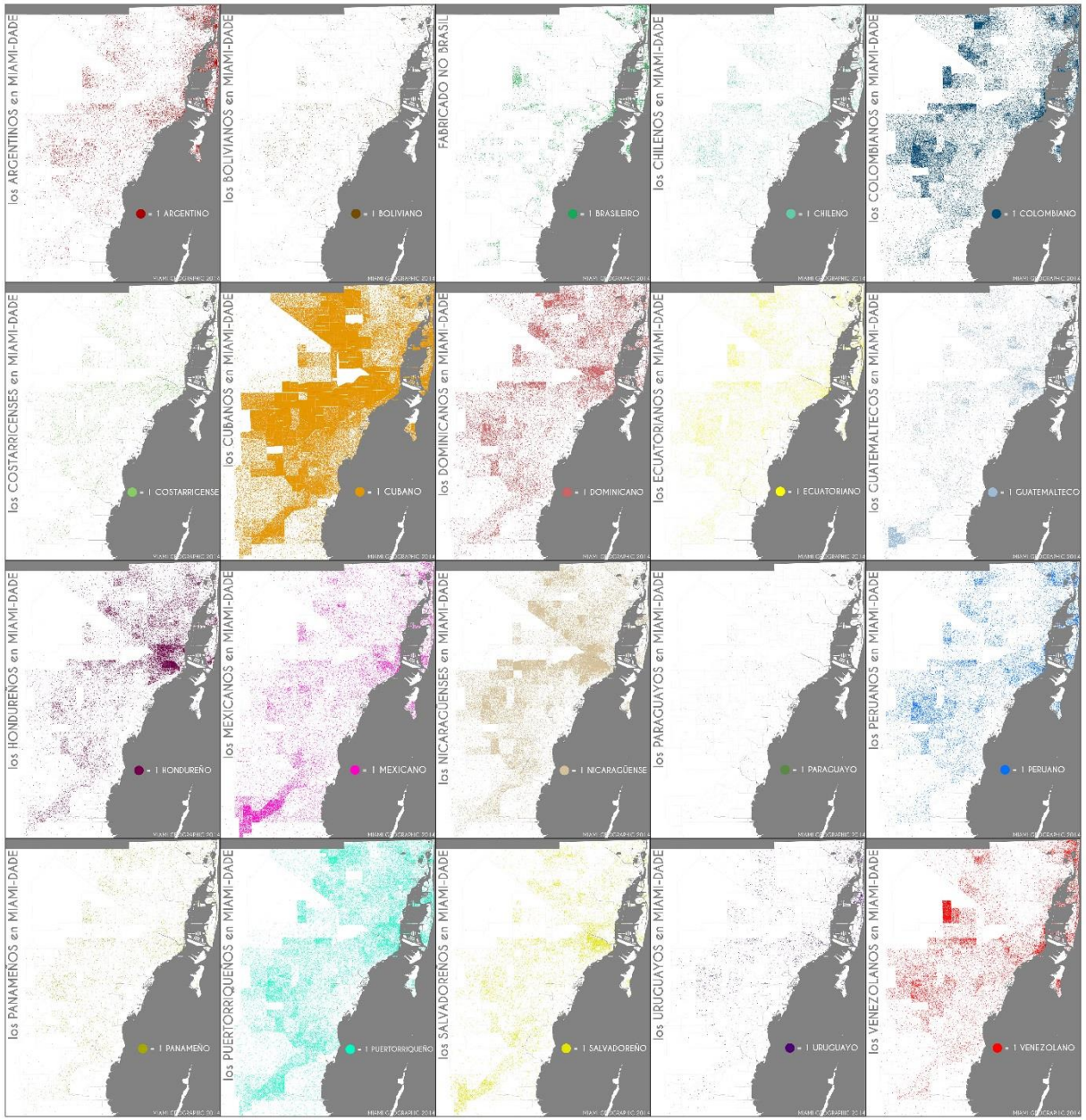

GIS
DIGITAL CARTOGRAPHY
Cartografía Digital

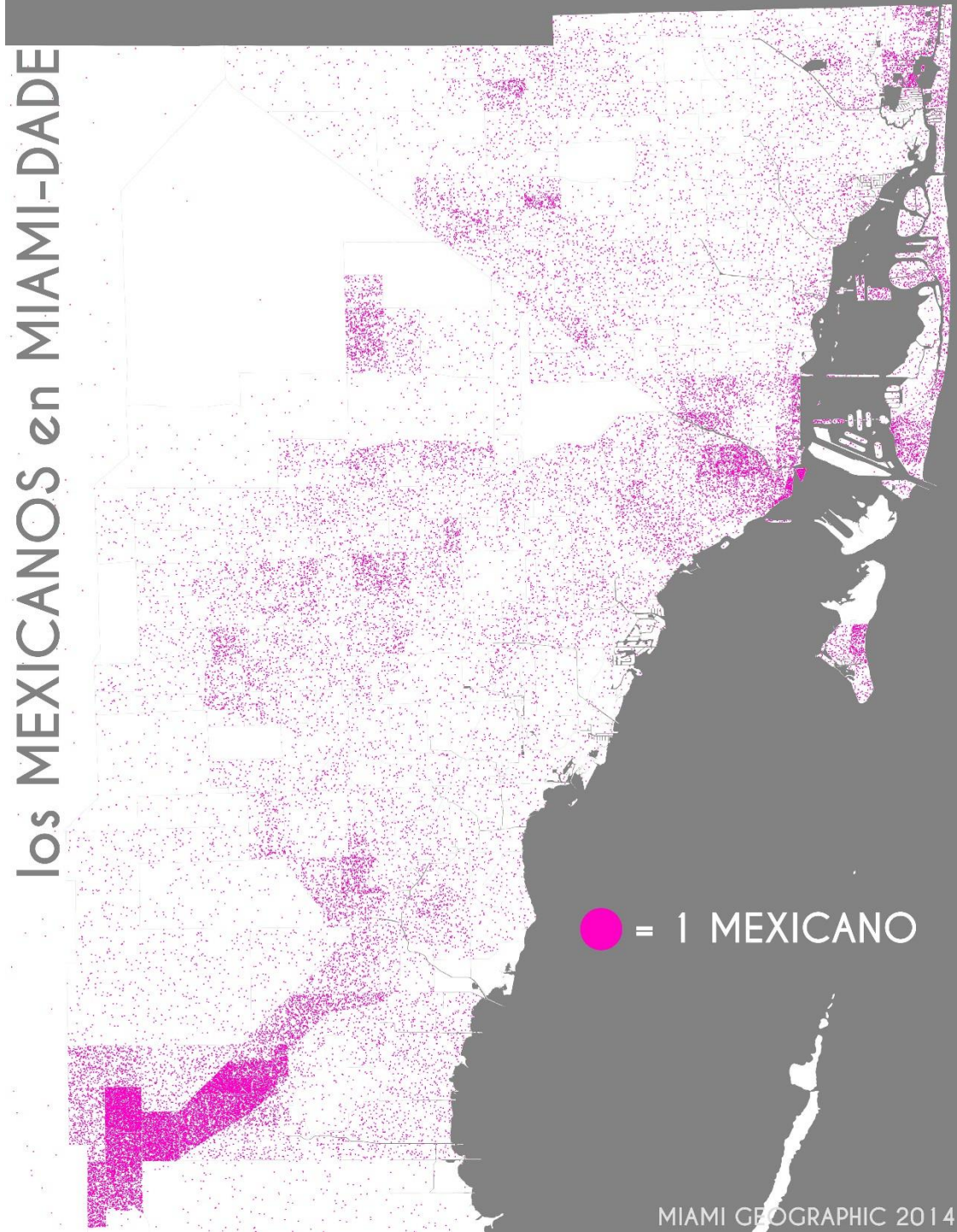
Ryan Clark's "Geology of the Grand Canyon" Interactive Web Map





[Miami Geographic, "Miami Geodesic Distances to World Cities — Global View"]

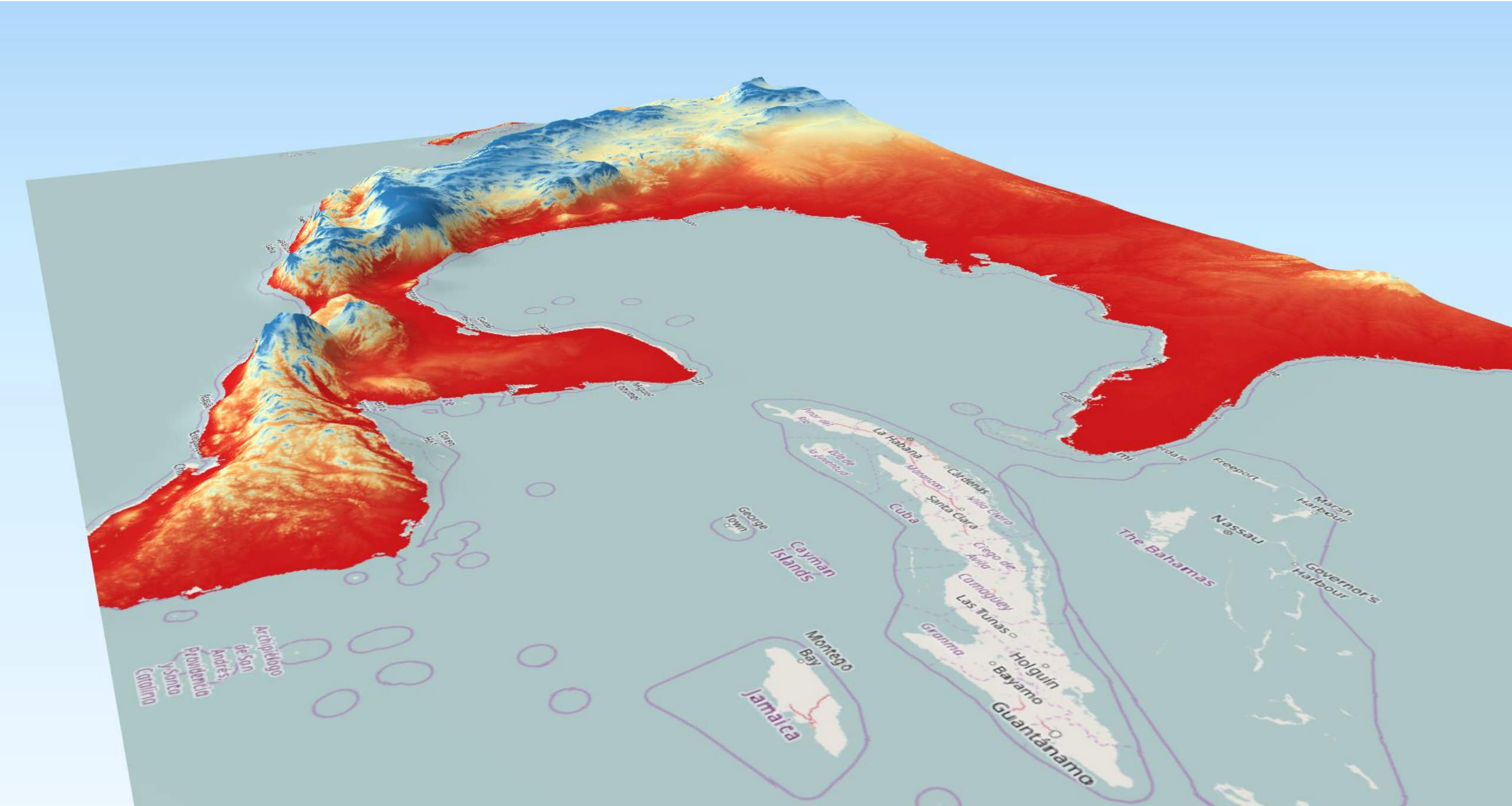


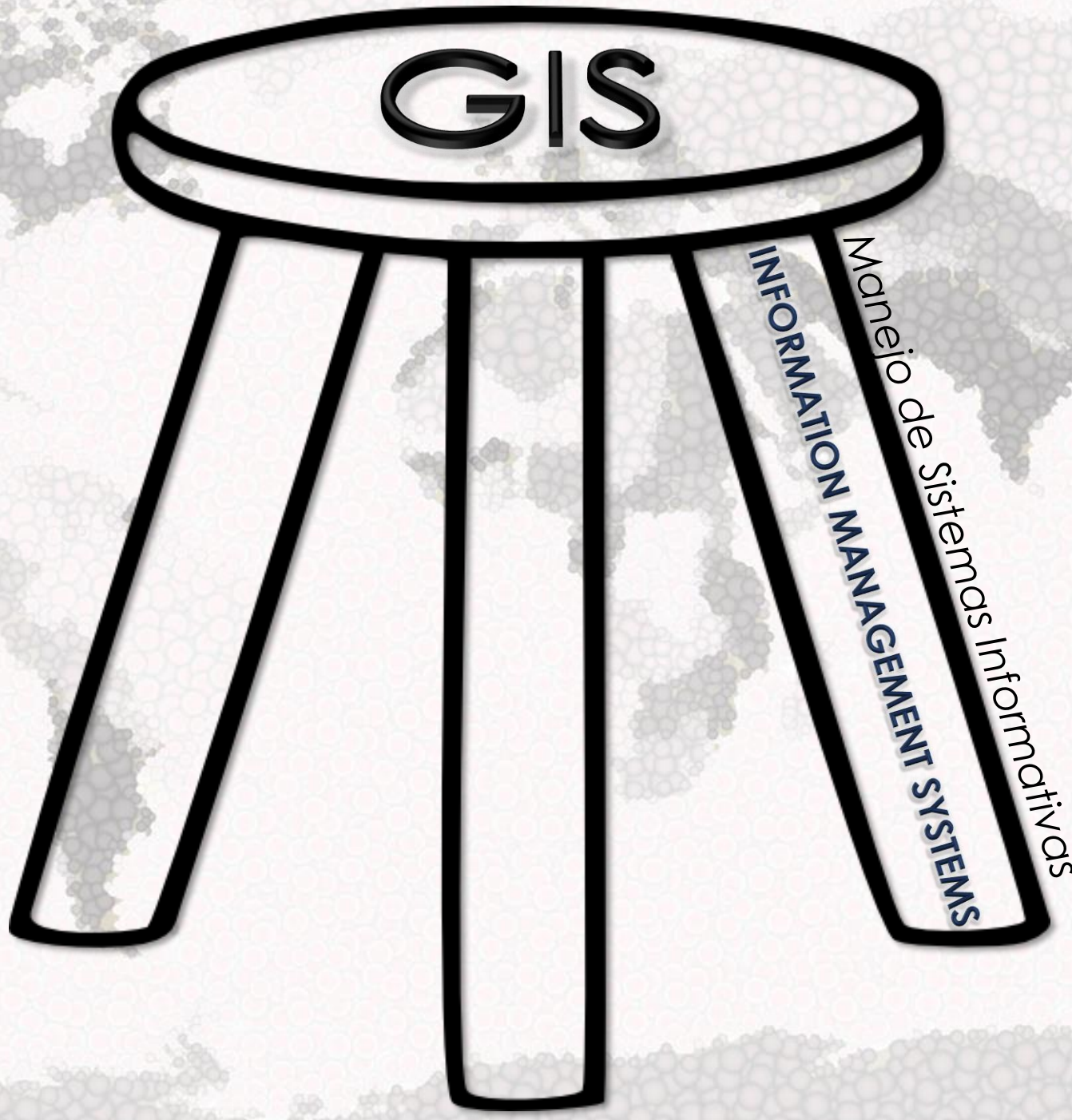


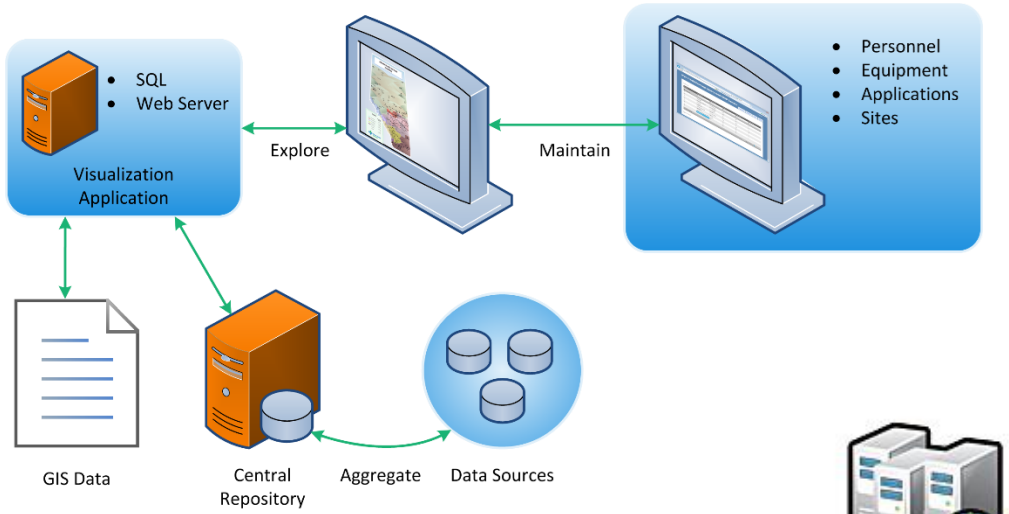
[Miami Geographic, “Los latinos en Miami-Dade, Compilation” (2010)]

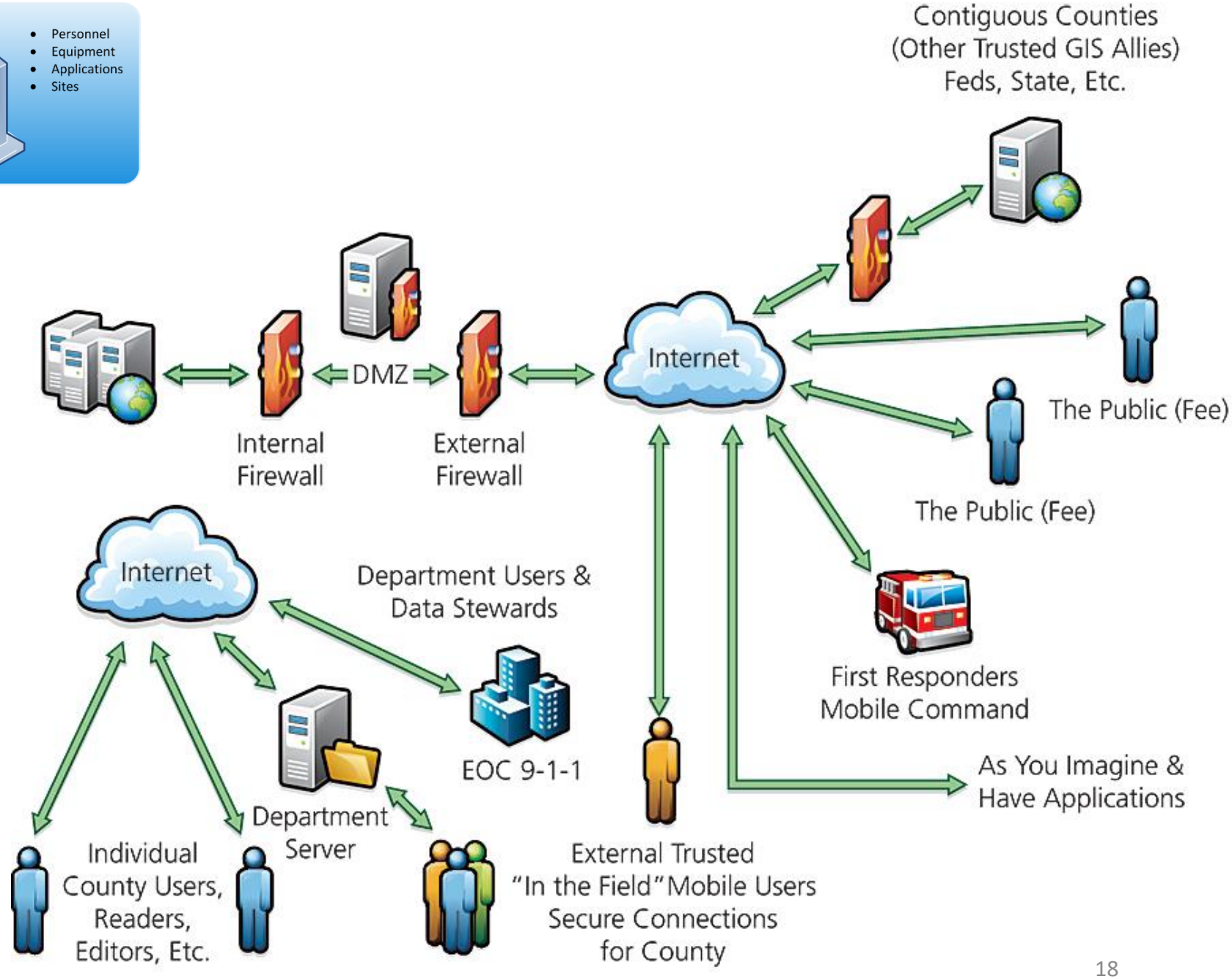
[Miami Geographic, “Los mexicanos en Miami-Dade” (2010)]

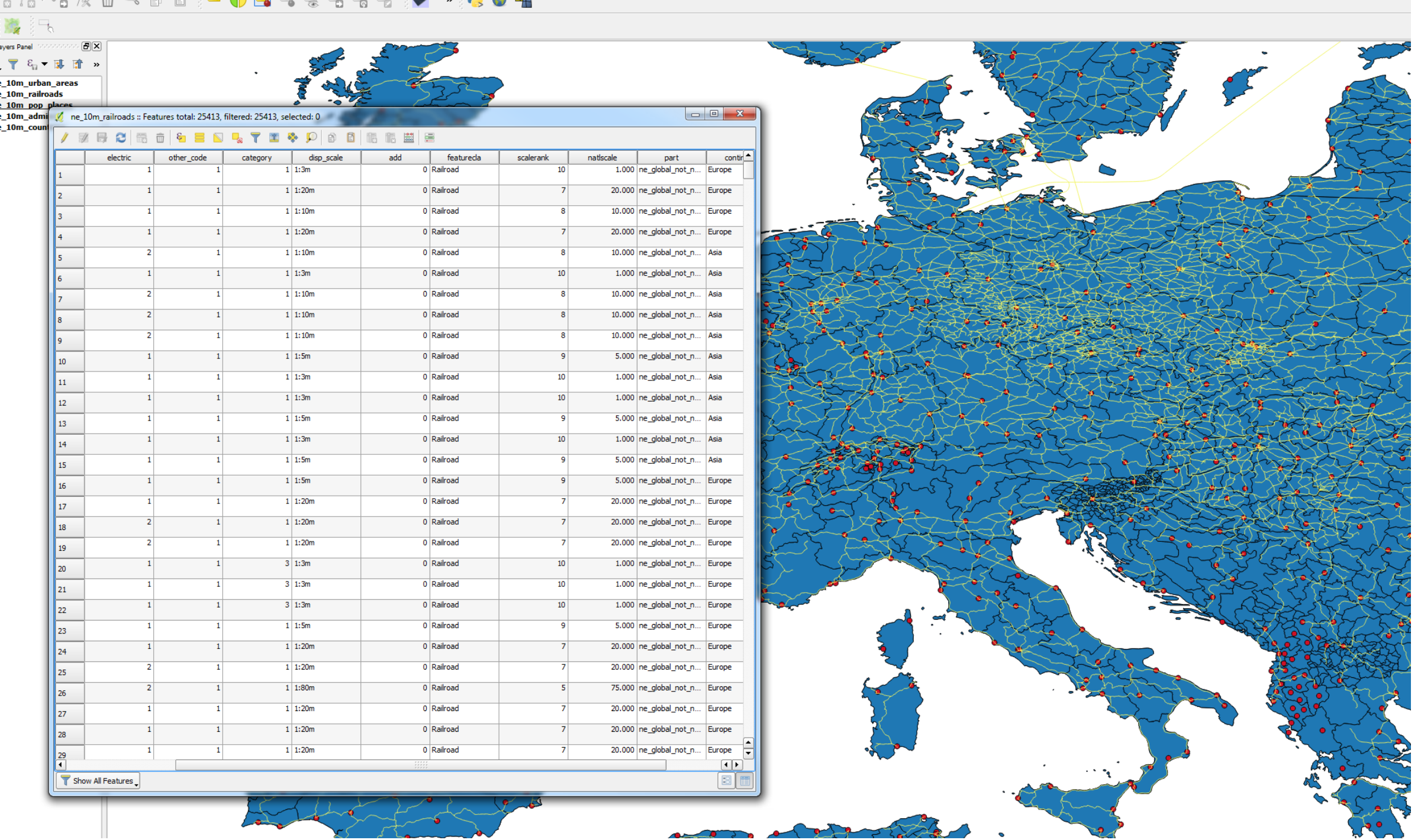
1000-meter Digital Elevation Model (DEM) overlaid upon Open Street Map – southern North America




GIS
INFORMATION MANAGEMENT SYSTEMS
Manejo de Sistemas Informativas


SQL
Web Server
Visualization Application
Explore
Maintain
Personnel
Equipment
Applications
Sites
GIS Data
Central Repository
Aggregate
Data Sources


Contiguous Counties
(Other Trusted GIS Allies)
Feds, State, Etc.
Internet
DMZ
Internal Firewall
External Firewall
The Public (Fee)
The Public (Fee)
Internet
Department Users & Data Stewards
EOC 9-1-1
First Responders Mobile Command
As You Imagine & Have Applications
Department Server
Individual County Users, Readers, Editors, Etc.
External Trusted "In the Field" Mobile Users Secure Connections for County



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3	1	1	1	1:10m	0	Railroad	8	10.000	ne_global_not_n...	Europe
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6	1	1	1	1:3m	0	Railroad	10	1.000	ne_global_not_n...	Asia
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11	1	1	1	1:3m	0	Railroad	10	1.000	ne_global_not_n...	Asia
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21	1	1	3	1:3m	0	Railroad	10	1.000	ne_global_not_n...	Europe
22	1	1	3	1:3m	0	Railroad	10	1.000	ne_global_not_n...	Europe
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24	1	1	1	1:20m	0	Railroad	7	20.000	ne_global_not_n...	Europe
25	2	1	1	1:20m	0	Railroad	7	20.000	ne_global_not_n...	Europe
26	2	1	1	1:80m	0	Railroad	5	75.000	ne_global_not_n...	Europe
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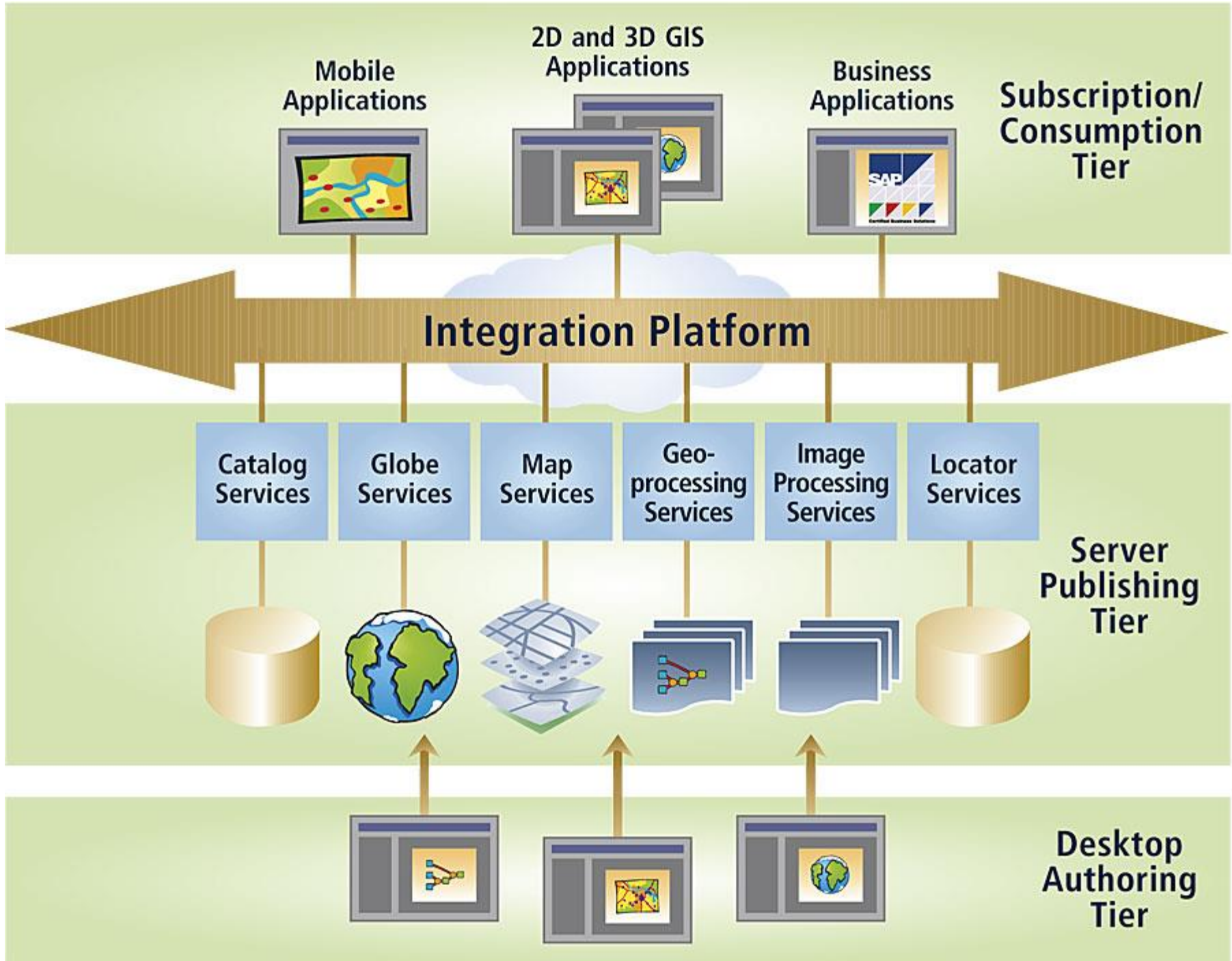
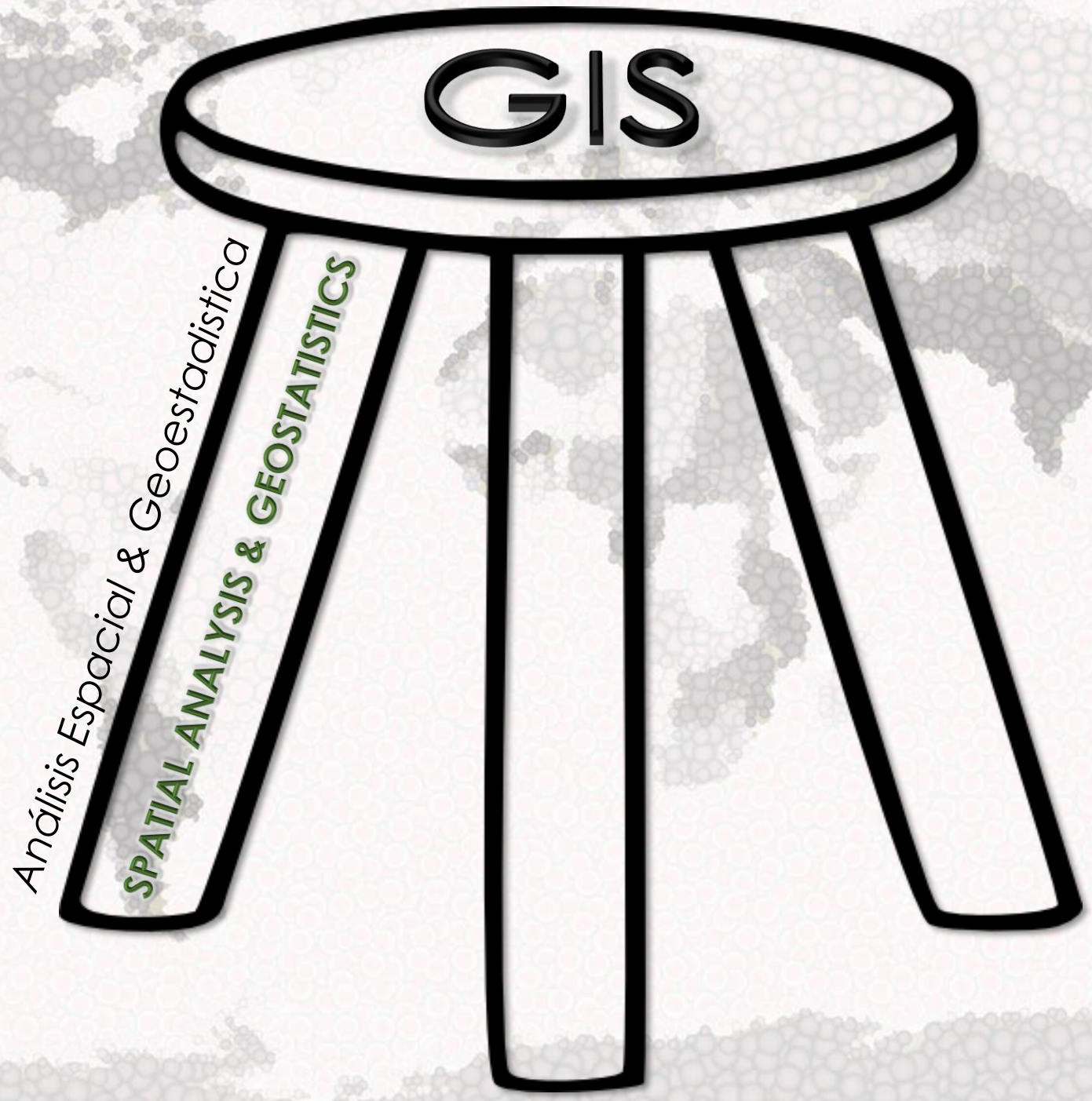
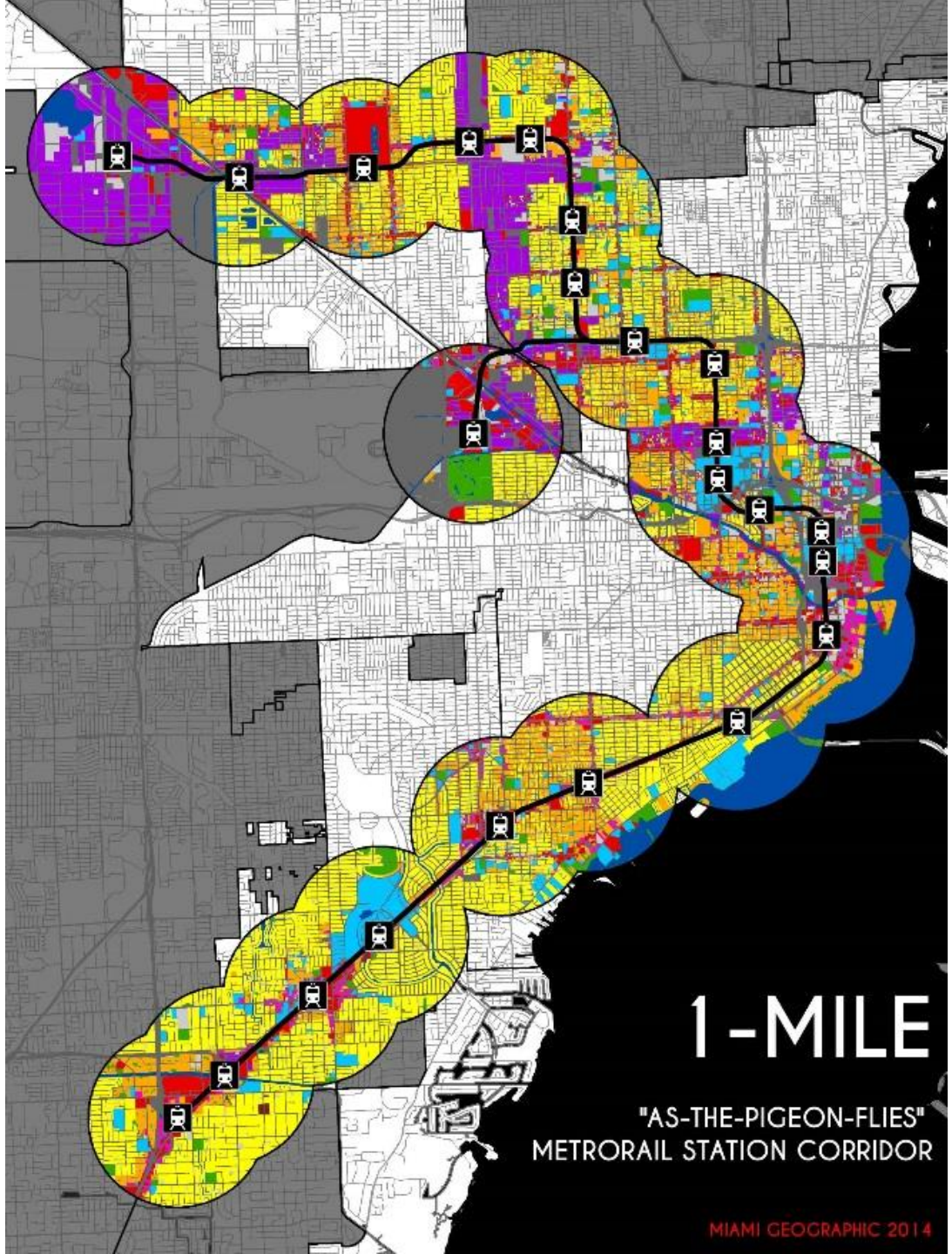

Mobile Applications
2D and 3D GIS Applications
Business Applications
Subscription/ Consumption Tier
Integration Platform
Catalog Services
Globe Services
Map Services
Geo-processing Services
Image Processing Services
Locator Services
Server Publishing Tier
Desktop Authoring Tier


GIS
Análisis Espacial & Geoestadística
SPATIAL ANALYSIS & GEOSTATISTICS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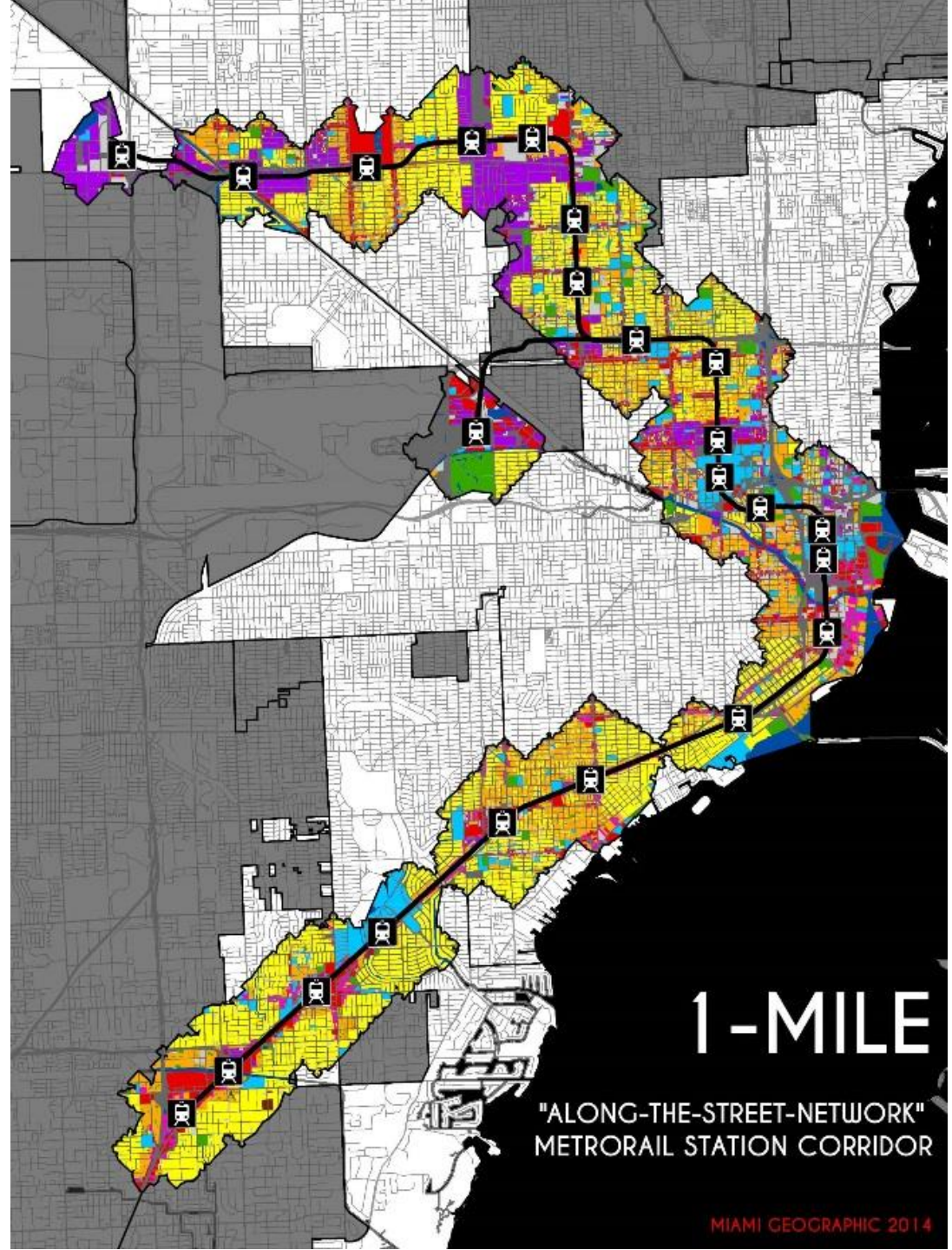
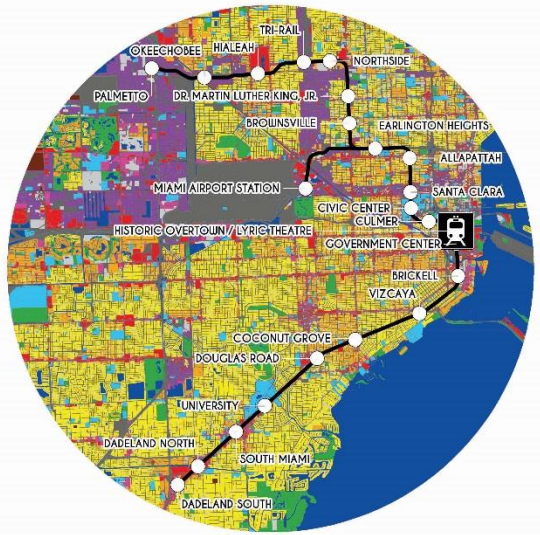
"AS-THE-PIGEON-FLIES"
METRORAIL STATION CORRIDOR
MIAMI GEOGRAPHIC 2014


1-MILE
"ALONG-THE-STREET-NETWORK"
METRORAIL STATION CORRIDOR
MIAMI GEOGRAPHIC 2014

HISTORIC OVERTOWN / LYRIC THEATRE
METRORAIL STATION LAND-USE 2014

METRORAIL SYSTEM

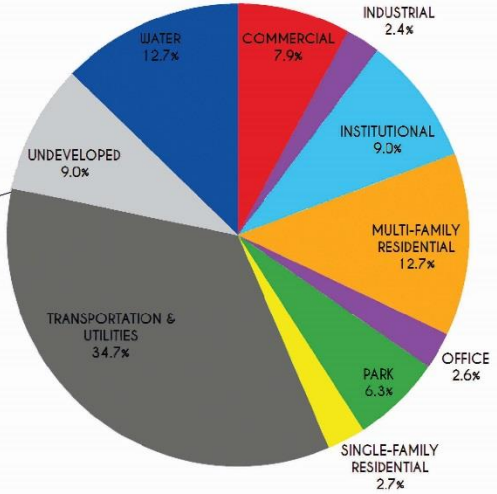


LAND-USE CLASSES

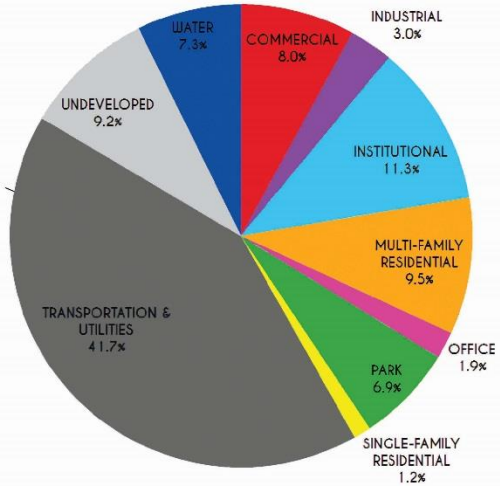
- AGRICULTURAL
- COMMERCIAL
- INDUSTRIAL
- INSTITUTIONAL
- MULTI-FAMILY RESIDENTIAL
- OFFICE
- PARK
- SINGLE-FAMILY RESIDENTIAL
- TRANSPORTATION & UTILITIES
- UNDEVELOPED
- WATER

0 0.25 0.5 1 MILE

1 MILE AS-THE-PIGEON-FLIES



1 MILE ALONG-THE-STREET-NETWORK



MIAMI GEOGRAPHIC 2014

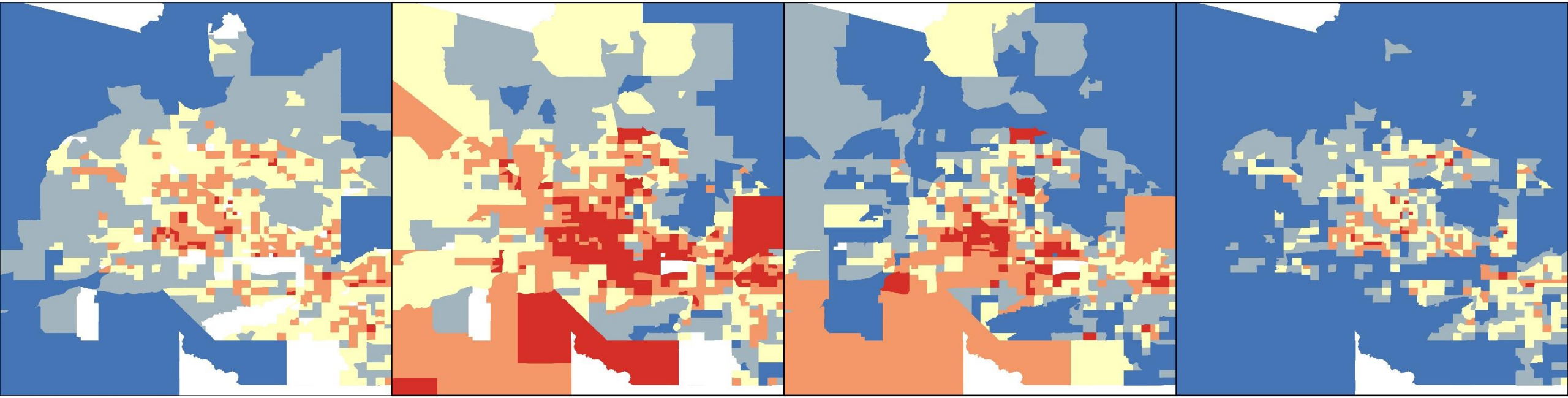
[Miami Geographic, "Understanding Miami's Metrorail Land Use"]

POPULATION DENSITY

HOUSEHOLD INCOME

PERCENTAGE HEALTH INSURED

VETERAN DENSITY

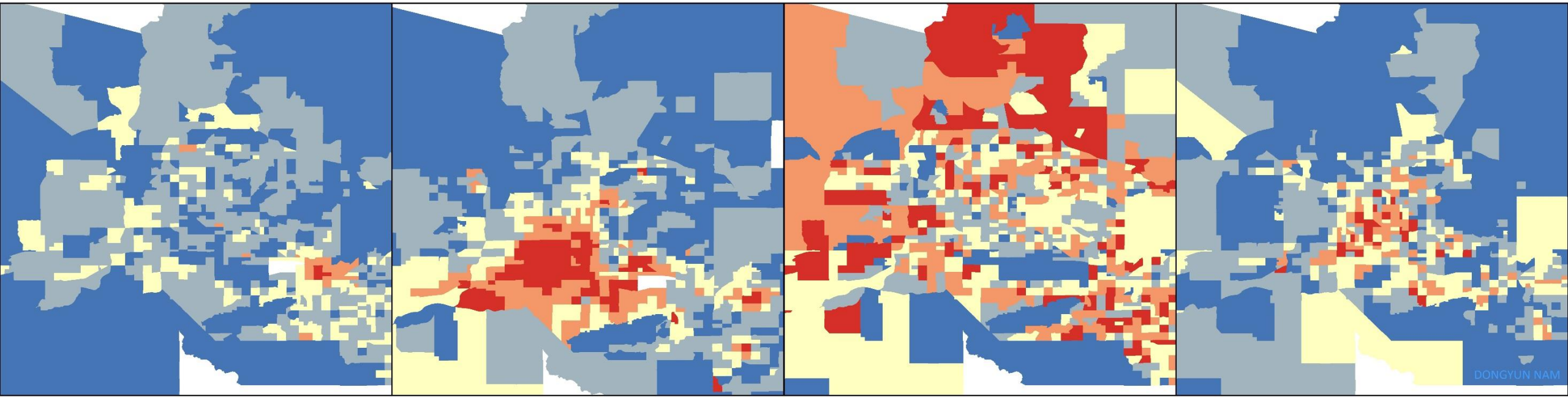


COLLEGE ENROLLEES

MULTILINGUAL PERSONS

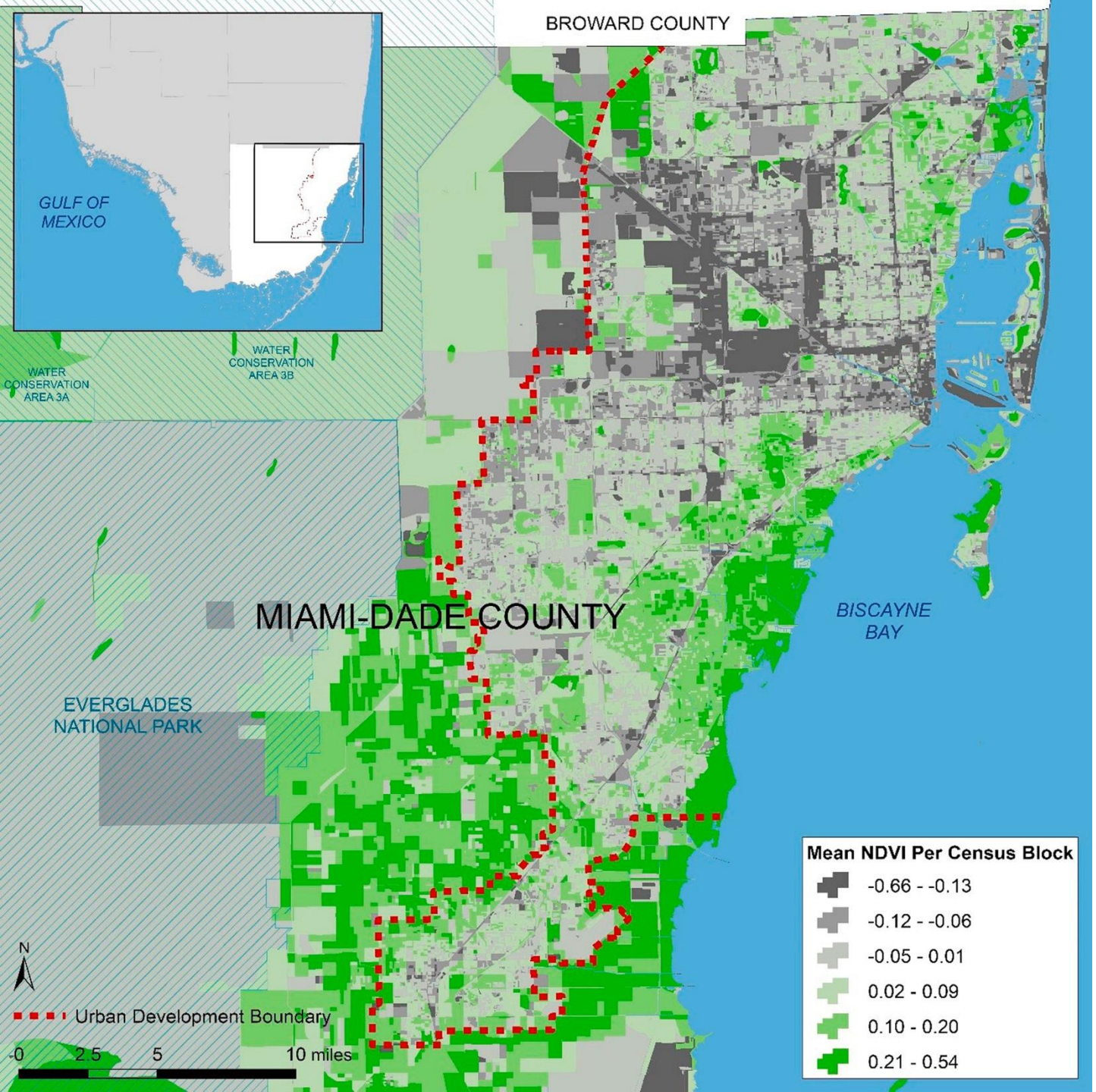
DRIVE TO WORK

FOOD STAMP RECIPIENTS



PHOENIX METROPOLITAN AREA CENSUS TRACTS

US CENSUS AMERICAN COMMUNITY SURVEY (ACS) 5-YEAR ESTIMATE



AJPM American Journal of Preventive Medicine
A Journal of the American College of Preventive Medicine and Association for Prevention Teaching and Research

Neighborhood Greenness and Chronic Health Conditions in Medicare Beneficiaries

Scott C. Brown, PhD, Joanna Lombard, MArch, Kefeng Wang, MS, Margaret M. Byrne, PhD, Matthew Toro, MA, Elizabeth Plater-Zyberk, MArch, Daniel J. Feaster, PhD, Jack Kardys, MSM, Maria I. Nardi, MLArch, Gianna Perez-Gomez, PhD, Hilda M. Pantin, PhD, José Szapocznik, PhD

PlumX Metrics
DOI: http://dx.doi.org/10.1016/j.amepre.2016.02.008 | CrossMark
Article Info

Abstract | Full Text | Images | References | Supplemental Materials

Introduction
Prior studies suggest that exposure to the natural environment may impact health. The present study examines the association between objective measures of block-level greenness (vegetative presence) and chronic medical conditions, including cardiometabolic conditions, in a large population-based sample of Medicare beneficiaries in Miami-Dade County, Florida.

Methods
The sample included 249,405 Medicare beneficiaries aged ≥65 years whose location (ZIP+4) within Miami-Dade County, Florida, did not change, from 2010 to 2011. Data were obtained in 2013 and multilevel analyses conducted in 2014 to examine relationships between greenness, measured by mean Normalized Difference Vegetation Index from satellite imagery at the Census block level, and chronic health conditions in 2011, adjusting for neighborhood median household income, individual age, gender, race, and ethnicity.

Results
Higher greenness was significantly associated with better health, adjusting for covariates: An increase in mean block-level Normalized Difference Vegetation Index from 1 SD less to 1 SD more than the mean was associated with 49 fewer chronic conditions per 1,000 individuals, which is approximately similar to a reduction in age of the overall study population by 3 years. This same level of increase in mean Normalized Difference Vegetation Index was associated with a reduced risk of diabetes by 14%, hypertension by 13%, and hyperlipidemia by 10%. Planned post-hoc analyses revealed stronger and more consistently positive relationships between greenness and health in lower- than higher-income neighborhoods.

Conclusions
Greenness or vegetative presence may be effective in promoting health in older populations, particularly in poor neighborhoods, possibly due to increased time outdoors, physical activity, or stress mitigation.

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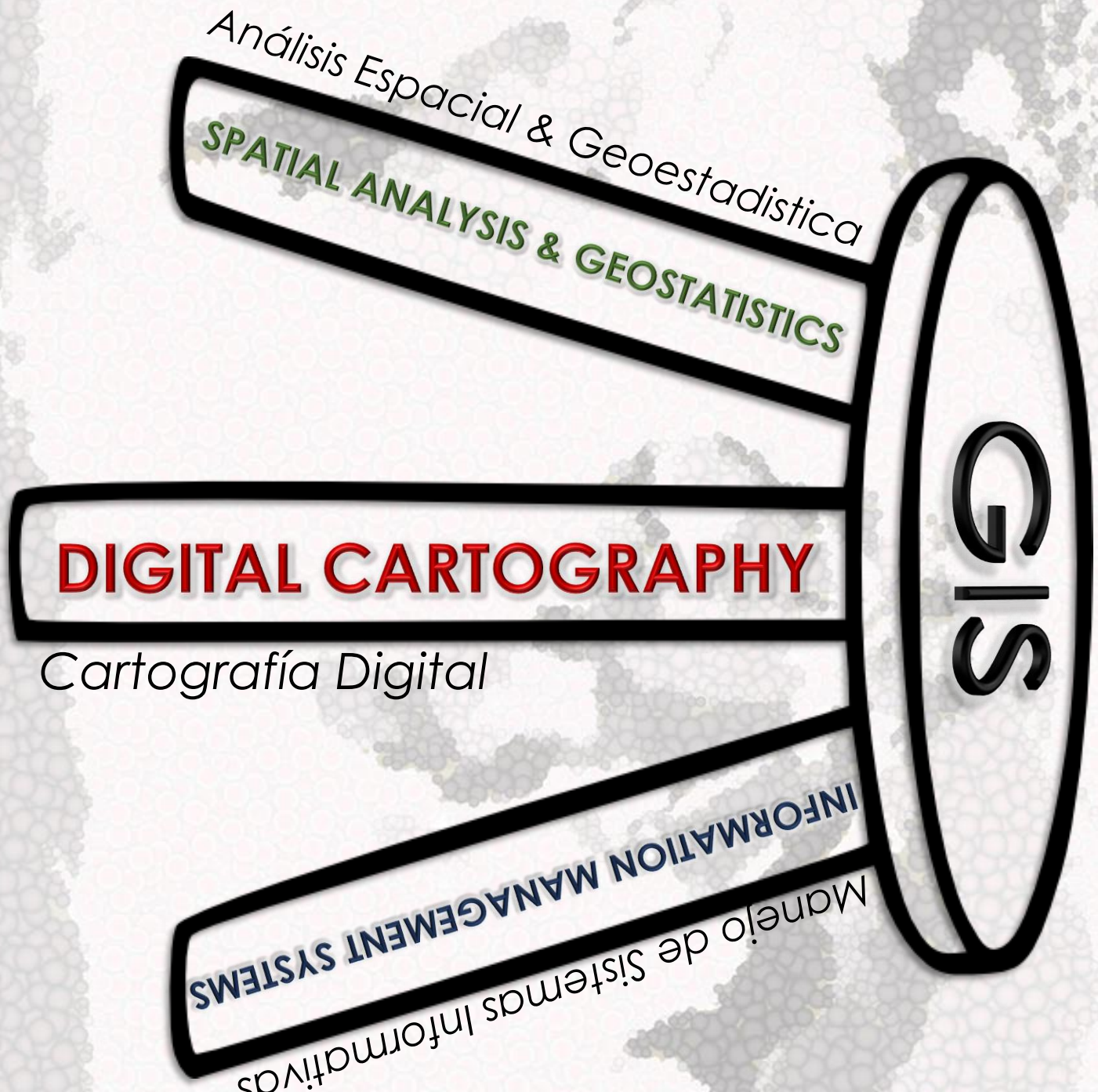
American Journal of Preventive Medicine, Vol. 53, Issue 2
Perceived Neighborhood Social Cohesion and Preventive Healthcare Use
American Journal of Preventive Medicine, Vol. 53, Issue 2
Neighborhood Factors and Dating Violence Among Youth: A Systematic Review
American Journal of Preventive Medicine, Vol. 49, Issue 3
Change in Neighborhood


Análisis Espacial & Geoestadistica
SPATIAL ANALYSIS & GEOSTATISTICS
DIGITAL CARTOGRAPHY
Cartografía Digital
INFORMATION MANAGEMENT SYSTEMS
Manejo de Sistemas Informativas
GIS

What are geospatial data?

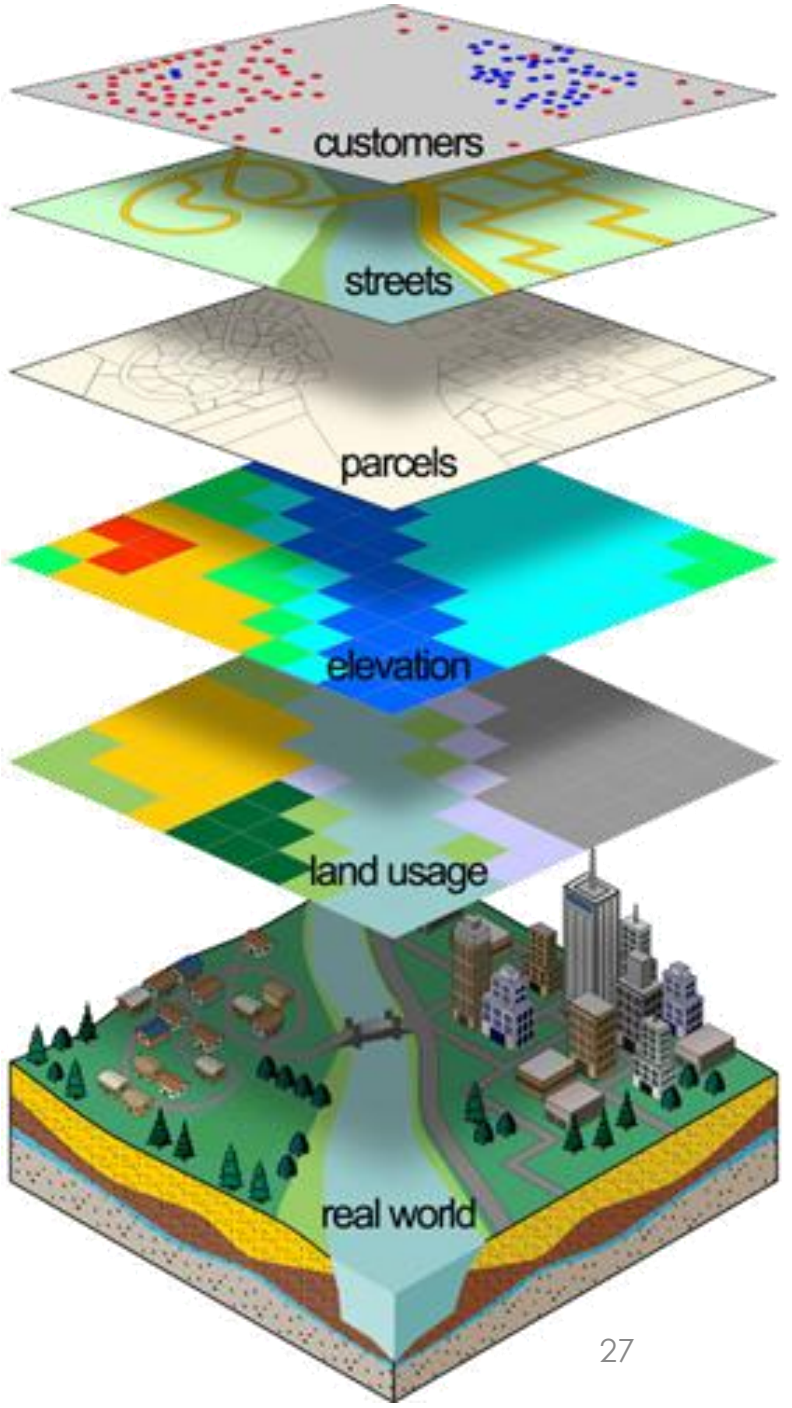
¿Qué son los datos geoespaciales?

Geospatial data have been explicitly defined across geographic space.

Los datos geoespaciales se han definido explícitamente en el espacio geográfico.

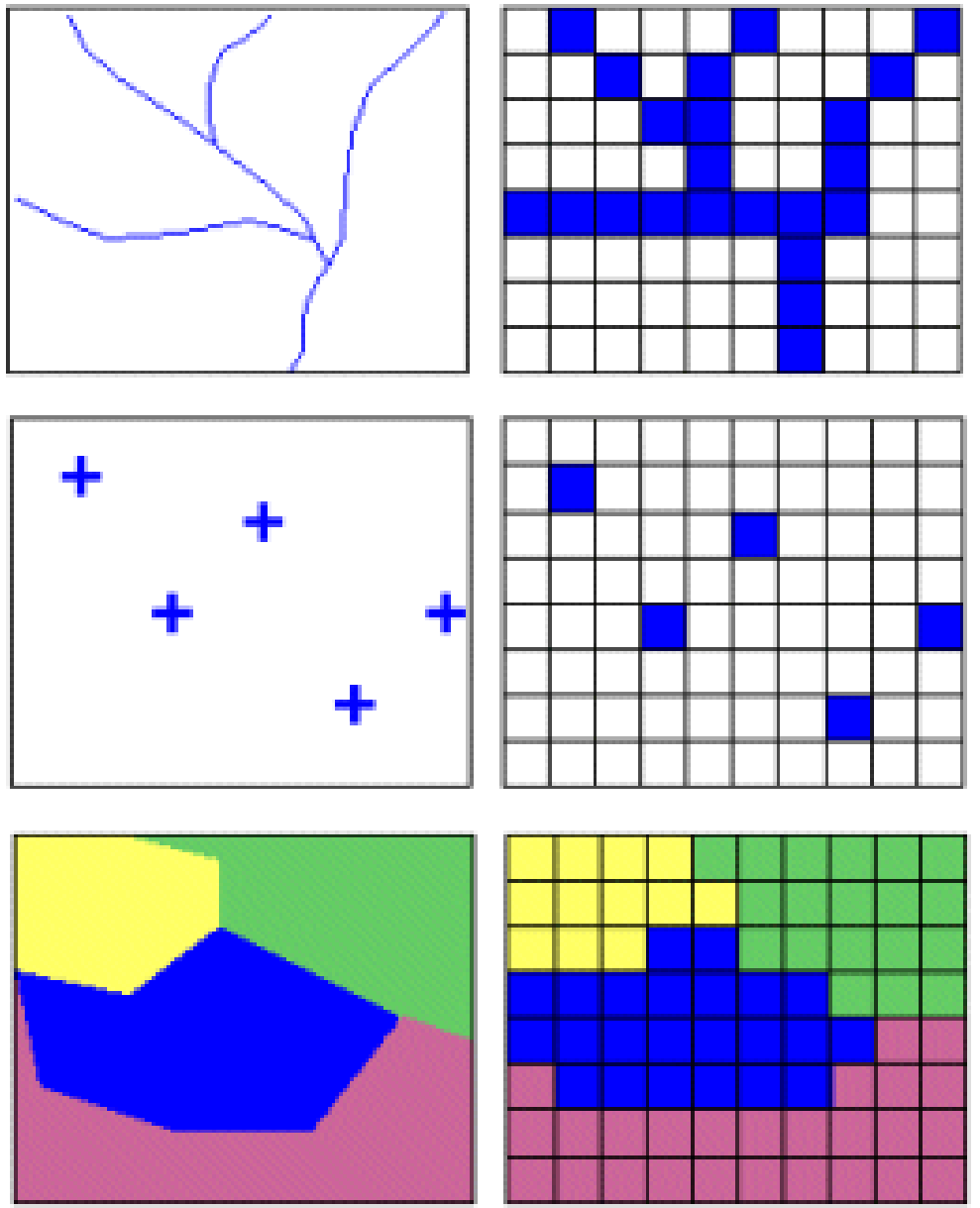
Coordinates define where they belong.

Las coordinadas definen dónde pertenecen.



Geospatial Data Models *Modelos de Datos Geoespaciales*

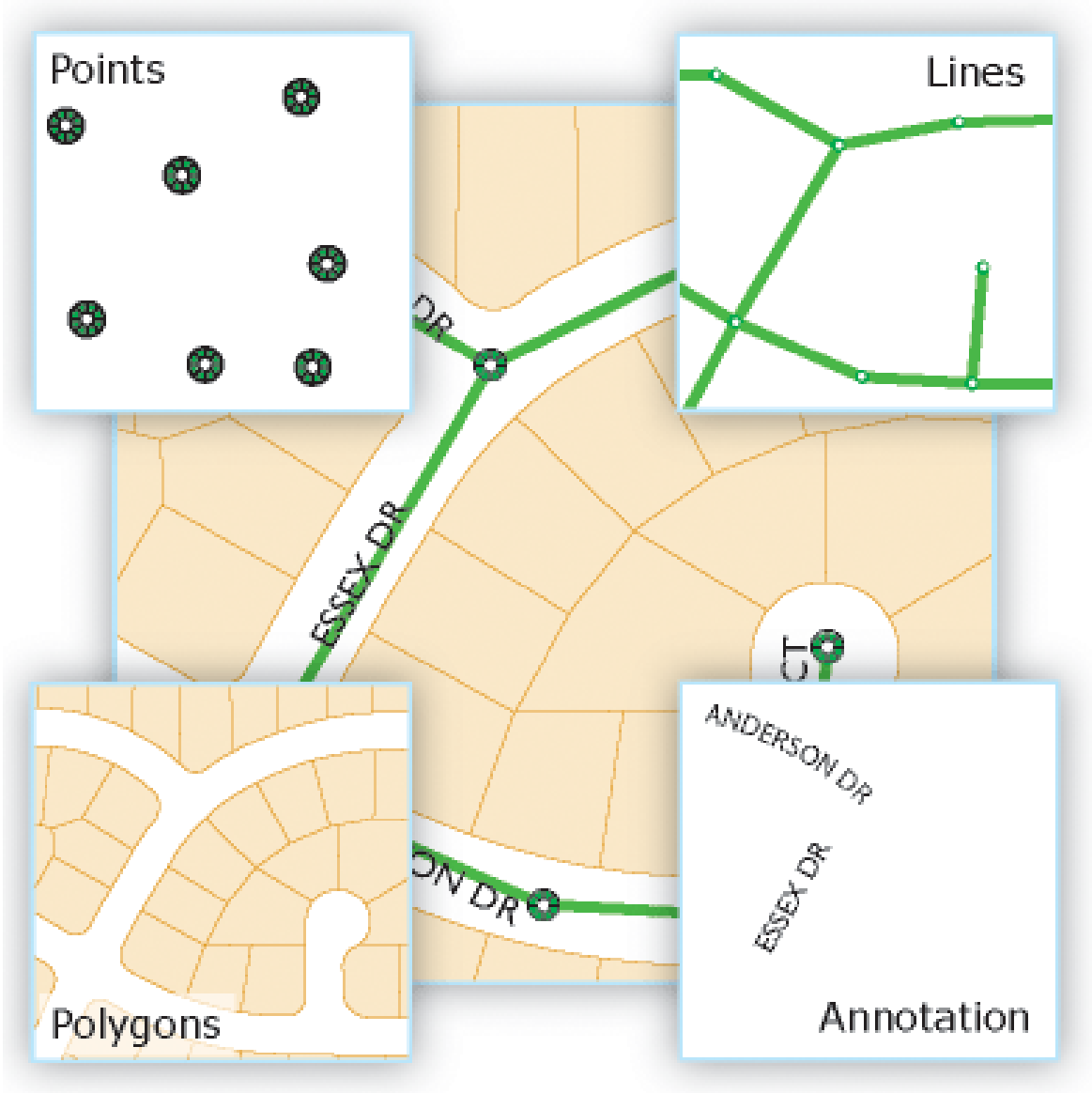
VECTOR



RASTER

Vector Data

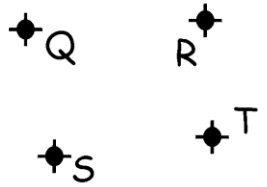
Datos Vectoriales



Vector Data

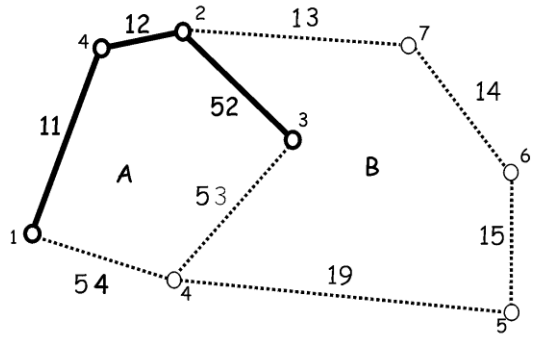
Datos Vectoriales

Points



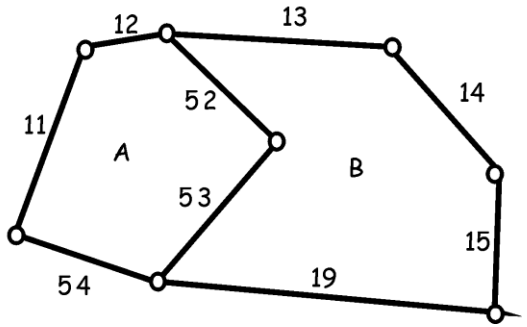
Point ID	X	Y
Q	32.7	45.6
R	76.3	19.5
S	22.7	15.8
etc...		

Lines



Line ID	Begin node	End node	Left poly	Right poly
11	1	4	...	A
12	4	2	...	A
52	2	3	B	A
etc ..				

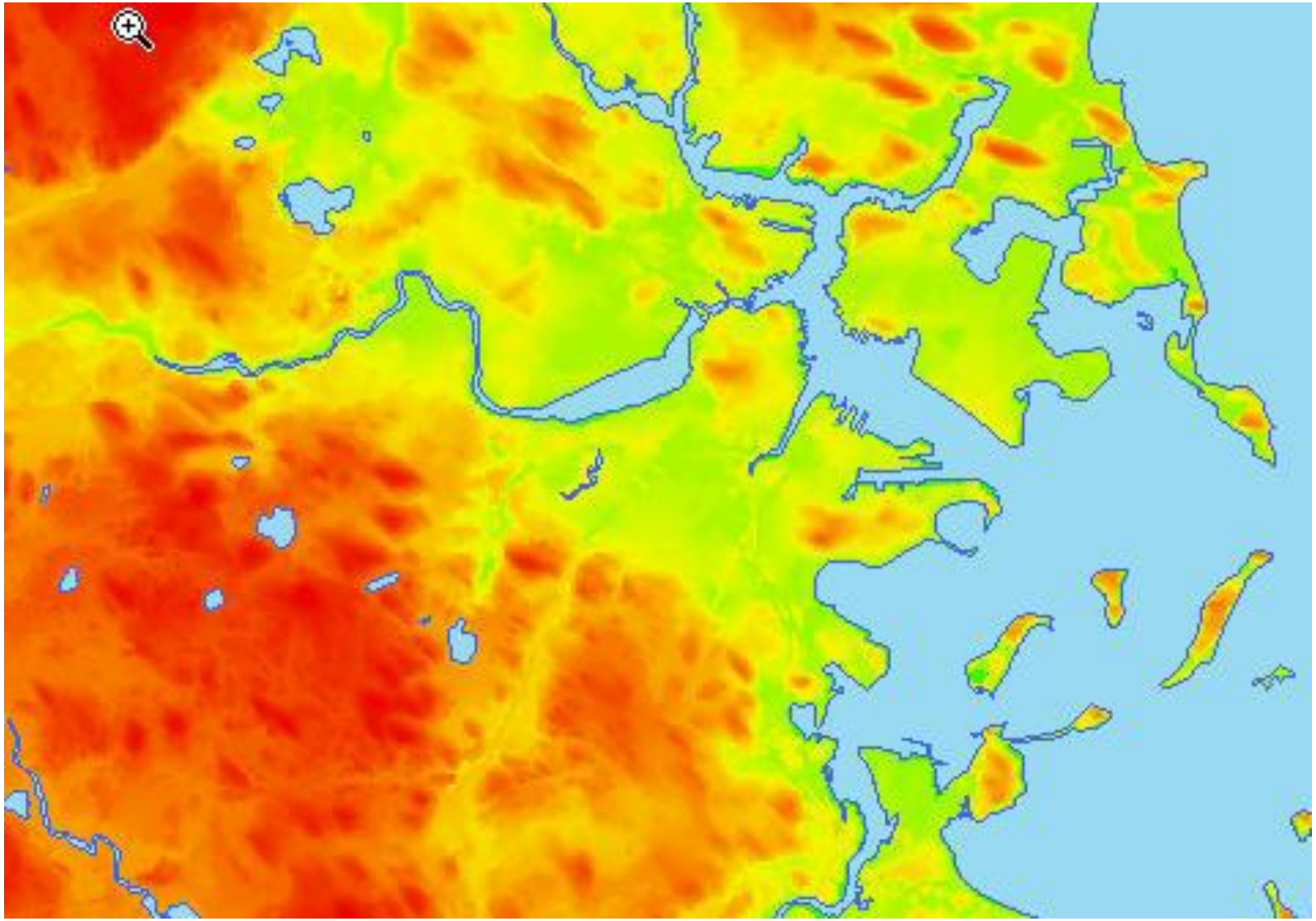
Polygons



Polygon ID	Lines
A	11,12,52,53,54
B	52,53,19, 15,14,13

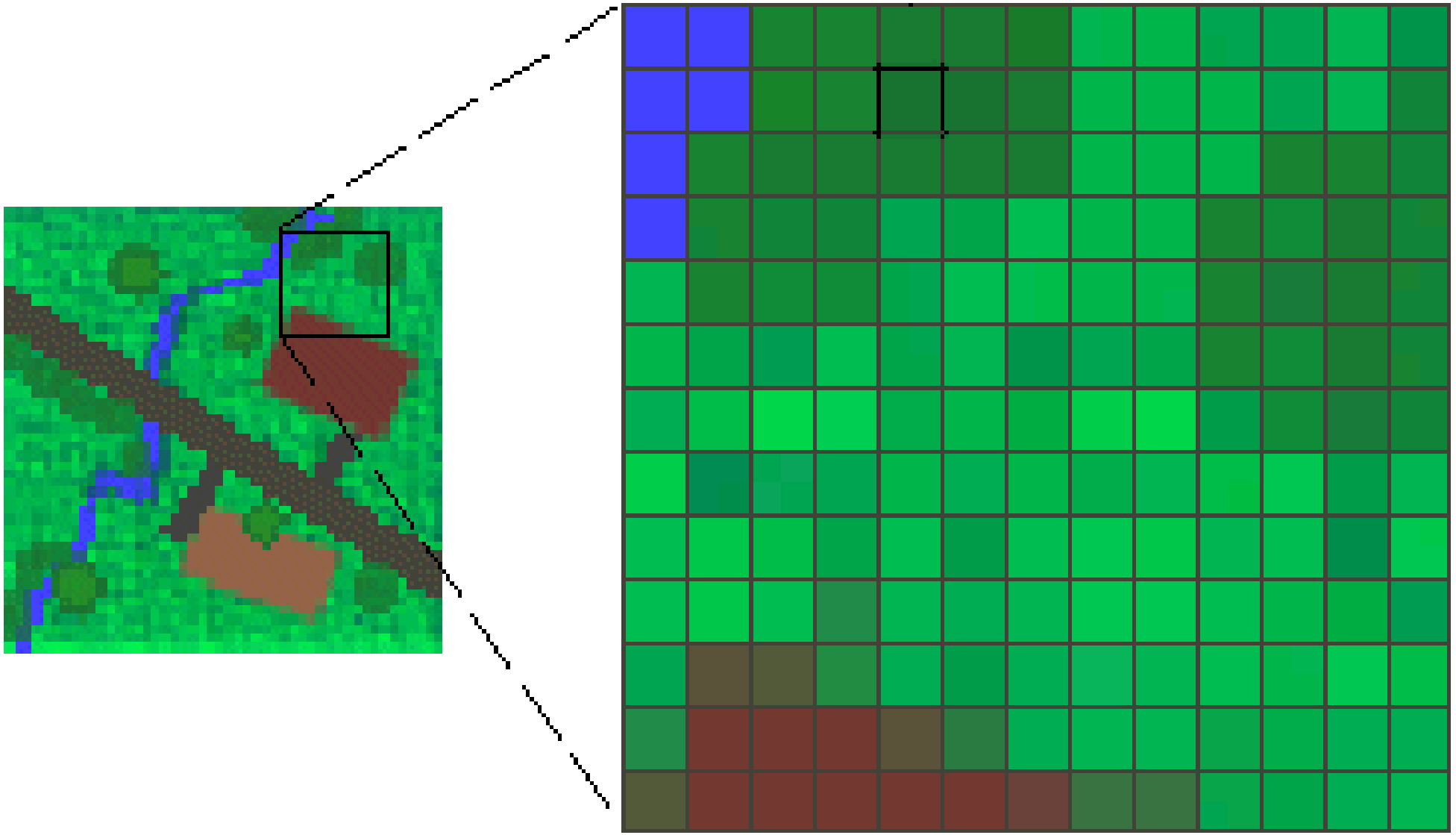
Raster Data

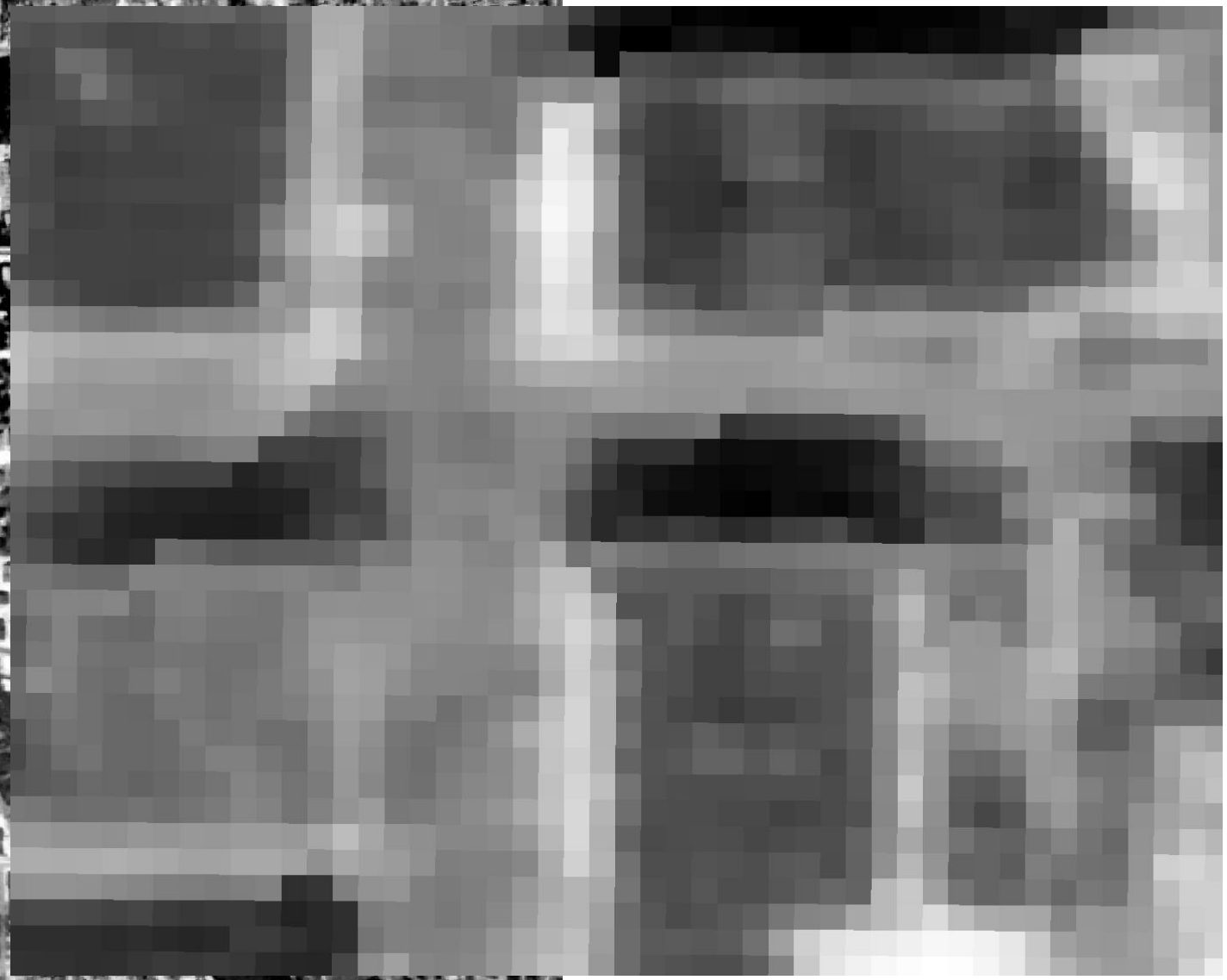
Datos Raster

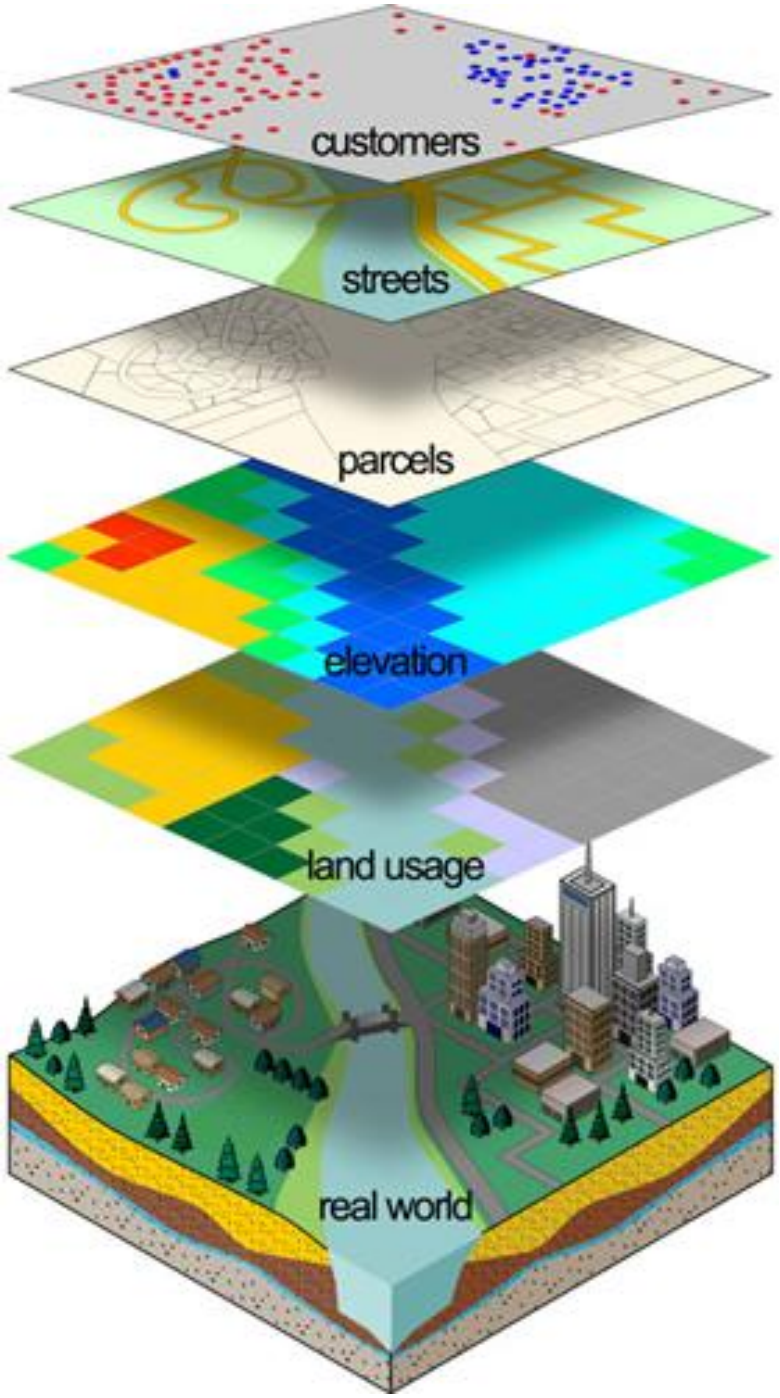


Raster Data

Datos Raster







Data in Layers

Datos en capas

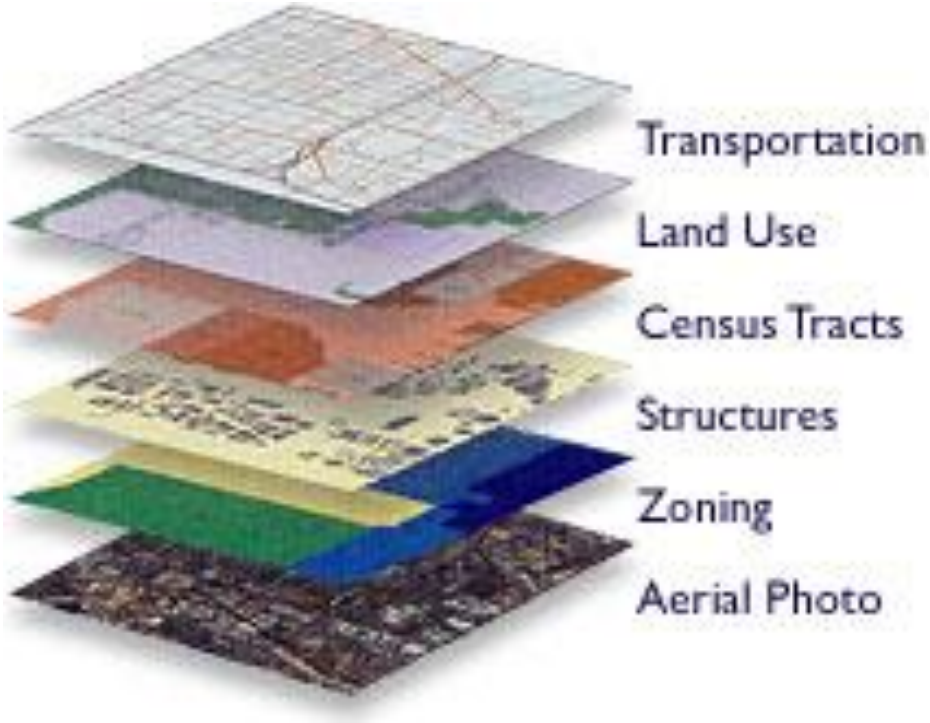
- GIS enables LAYERING of geospatial data
- *GIS habilita LAYERING de datos geoespaciales*

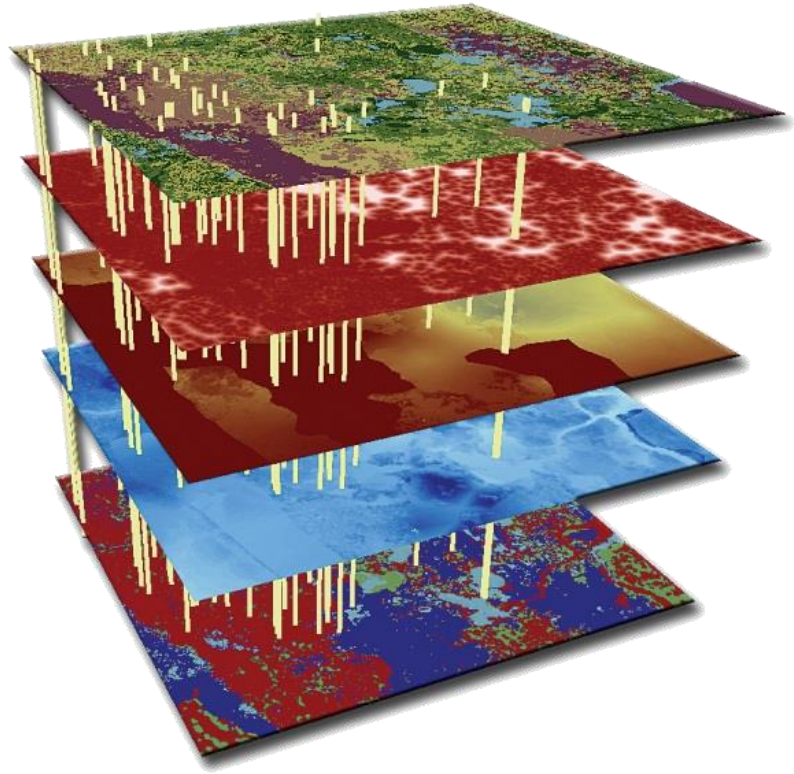
- Each LAYER contains a particular *theme* of data
- *Cada CAPA contiene un tema particular de datos*

- Each LAYER (theme) contains sets off similar features (vector) or surfaces (raster)
- *Cada CAPA (tema) contiene conjuntos de características similares (vector) o superficies (raster)*

Data in Layers

Datos en Capas





Where do you get geospatial data? 1

¿De dónde obtienes datos geoespaciales? 1

Hundreds of thousands of free geospatial data exists and can be accessed through:

- local-, state/provincial-, and national-level government repositories
- university and research repositories
- non-governmental organizations' repositories
- crowdsourced (volunteered) platforms (e.g., Open Street Map)

Existen cientos de miles de datos geoespaciales gratuitos a los que se puede acceder a través de:

- *repositorios gubernamentales a nivel local, estatal, provincial y nacional*
- *repositorios universitarios y de investigación*
- *depósitos de organizaciones no gubernamentales*
- *plataformas crowdsourced (voluntarias) (por ejemplo, Open Street Map)*

Natural Earth

Free vector and raster map data at 1:10m, 1:50m, and 1:110m scales

Search

Home | Features | Downloads | Blog | Forums | Corrections | About

Downloads

Data themes are available in three levels of detail. For each scale, themes are listed on Cultural, Physical, and Raster category pages.

Stay up to date! Know when a new version of Natural Earth is released by subscribing to our announcement list.

Overwhelmed? The Natural Earth quick start kit (165 mb) provides a small sample of Natural Earth themes styled in an ArcMap .MXD document and in a QGIS document. Download all vector themes as SHP/GeoDB (279 mb) or as SQLite (222 mb).

Natural Earth is the creation of many volunteers and is supported by NACIS. It is free for use in any type of project. Full Terms of Use »

Large scale data, 1:10m

Cultural | Physical | Raster

The most detailed. Suitable for making zoomed-in maps of countries and regions. Show the world on a large wall poster.

1:10,000,000
1″ = 158 miles
1 cm = 100 km

Medium scale data, 1:50m

Cultural | Physical | Raster

Suitable for making zoomed-out maps of countries and regions. Show the world on a tabloid size page.

1:50,000,000
1″ = 790 miles
1 cm = 500 km

Small scale data, 1:110m

Cultural | Physical

Suitable for schematic maps of the world on a postcard or as a small locator globe.

1:110,000,000
1″ = 1,736 miles
1 cm = 1,100 km


AZGEO
CLEARINGHOUSE
My account
Log out
AZ.GOV
search
SEARCH
HOME
ABOUT
GROUPS
CATALOG
APPS
CONTRIBUTE
CONTACT
HELP
AZGEO USAGE STATISTICS
3941 screened and approved users
386 agencies and organizations
252 datasets
90 services
AZGEO Usage Statistics
Controlled Access
Standardized Metadata
Subscribe to Data
1. Join Groups
Join AZGEO Groups (or start your own) to gain access to group documents, datasets, and services.
2. Download Data
Search for data in the catalog or use the map viewer to explore map services and extract data.
3. Give Back
Give back to the community by contributing your GIS data and metadata and sharing it with AZGEO groups.

Explore the City of Phoenix! This Mapping Open Data can help you visualize and analyze city datasets. See planning and zoning areas or locate city properties and facilities. You can also download datasets to use in your own maps or projects.

Find Data

Search for Data

Explore Data Categories

Boundaries

Economic Development

Education

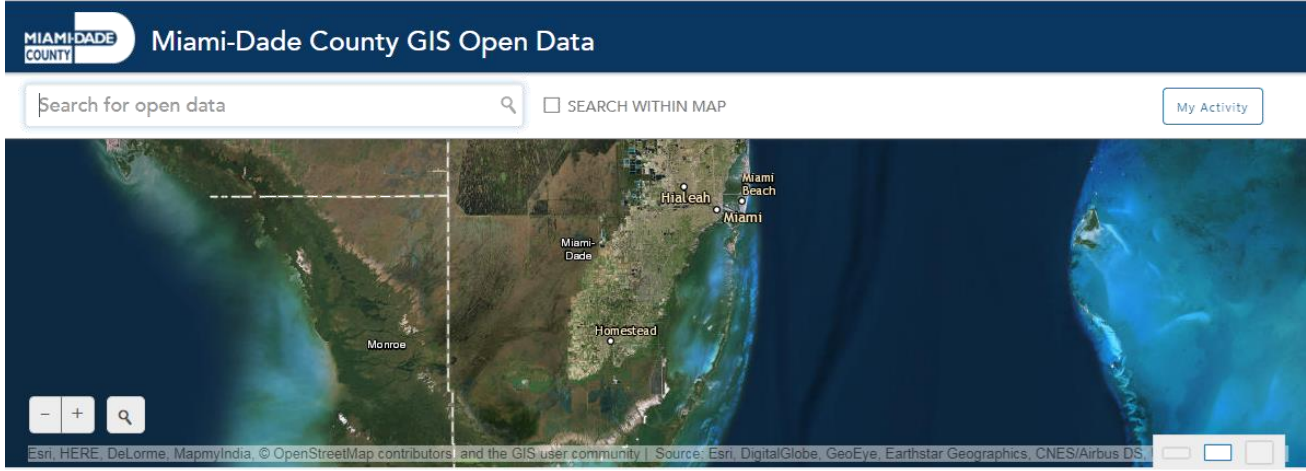
Facility and Structure

Historic

Planning, Development and Zoning

Property and Land

Public Safety



Categories

- Boundaries
- Buildings
- Demographics
- Education
- Electoral
- Environment
- Health
- Hydrology
- Imagery
- Infrastructure
- Location
- Parks
- Planning
- Property
- Public Safety
- Transportation
- Zoning

Welcome to the Miami-Dade County GIS Open Data Site

We are pleased to share the County's publicly available GIS data with citizens, developers, communities and agencies with an interest in spatial data. Use this site to access and download the data in multiple formats.

To visit the County's GIS websites or for more information go to our **GIS Portal** page and **GIS Self Services** page.

If you have questions, comments or suggestions, please contact **Miami-Dade County GIS**.

Using the Site

Select a category below to see a list of the data available for that category. You can also use the search bar at the top of the page to find data on your topic of interest. Data can be previewed in the map and downloaded as a spreadsheet, shapefile. KML or linked via API.
Click **here** to browse the entire data collection.

About the Data

Miami-Dade County provides this website as a public service to its residents and visitors. The County is continually editing and updating GIS data to improve positional accuracy and information. No warranties, expressed or implied, are provided for the positional or thematic accuracy of the data herein, its use, or its interpretation. Although it is periodically updated, this information may not reflect the data currently on file at Miami-Dade County and the County assumes no liability either for any errors, omissions, or inaccuracies in the information provided regardless of the cause of such or for any decision made, action taken, or action not taken by the user in reliance upon any information provided herein.

Recently Added

Miami-Dade County DEM 5ft

Bare-earth 5-foot DEM as 32-bit floating point raster format in ARCGIS GRID Raster format in compliance with USGS LIDAR Base Specifications

BY MDPUBLISHER AUGUST 22, 2017

Miami-Dade County DEM 10ft

Bare-earth 5-foot DEM as 32-bit floating point raster format in ARCGIS GRID Raster format in compliance with USGS LIDAR Base Specifications

BY MDPUBLISHER AUGUST 22, 2017

Book Mobile

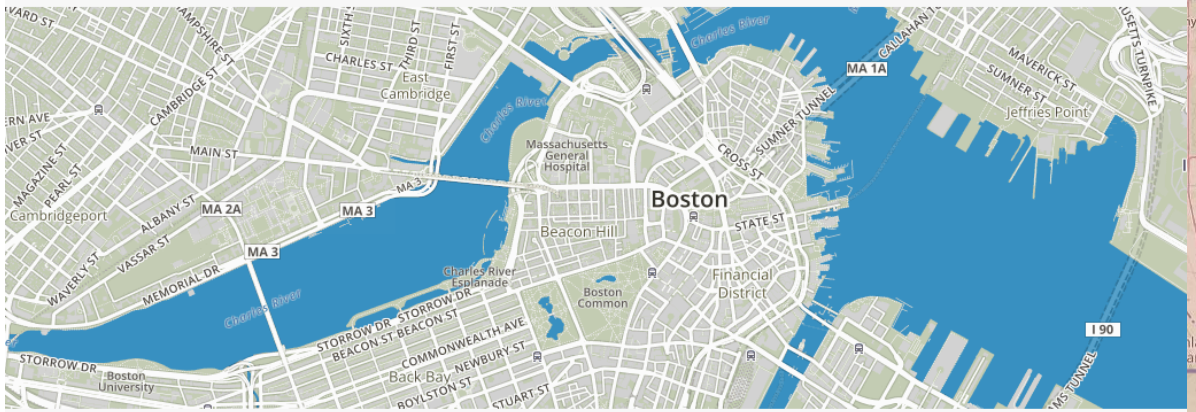
A point layer containing locations of Miami-Dade Public Library System's Book Mobile stops.

BY MDPUBLISHER AUGUST 21, 2017

USGS science for a changing world

SHARE | LIKE

topoView GET MAPS COMMENTS ABOUT HELP



Accessing Historical Topographic Maps Has Never Been Easier

TopoView highlights one of the USGS's most important and useful products, the **topographic map**. In 1879, the USGS began to map the Nation's topography. This mapping was done at different levels of detail, in order to support various land use and other purposes. As the years passed, the USGS produced new map versions of each area. The most current maps are available from **The National Map**. TopoView shows the many and varied older maps of each area, and so is useful for historical purposes—for example, the names of some natural and cultural features have changed over time, and the 'old' names can be found on these historical topographic maps.

This interface was created by the **National Geologic Map Database project** (NGMDB), in support of topographic mapping program managed by the **National Geospatial Program** (NGP). Geologic mapping and topographic mapping at the USGS have a long tradition together (see **1888 report**). The NGMDB project is proud to assist the NGP in bringing these maps to the Web.

Packed With New Features And Downloadable File Formats

The maps shown through topoView are from the USGS's **Historical Topographic Map Collection** (HTMC). The goal of this scanning, which started in 2011, is to provide a digital repository of USGS 1:250,000 scale and larger (more detailed) maps printed between 1884 (the inception of the topographic mapping program), and 2006. Currently, there are more than 178,000 maps in the HTMC. The NGP is accurately cataloging and creating metadata to accompany high-resolution, georeferenced digital files of each of these printed maps. At present, these maps are offered as GeoPDFs, through **The National Map** and the **USGS Store**. However, additional formats are now being offered for evaluation and use through **topoView** to include:

GeoTIFF – The GeoTIFF files are a compressed, 300 dpi TIFF image format, with embedded georeferencing information so that the map can be used directly in a Geographic Information System (GIS). The GeoTIFFs are generated at true scale, allowing users to plot the map at the intended map scale in cases where a hard copy is needed.

JPEG – The high-resolution JPEGs, or 'Browse JPEG' format are useful for getting a quick view of the map in order to find place names or simply explore the map area without the need for downloading a large file.

KMZ – The KMZ format is a compressed form of the KML format which is used for displaying the maps in Google Earth.

Send Us Your Feedback

We're pleased to offer these formats to you, and invite you to explore the collection of historical topographic maps. Help us make topoView more useful by sending us **comments and suggestions** on the site's usability and the addition of new downloadable formats.

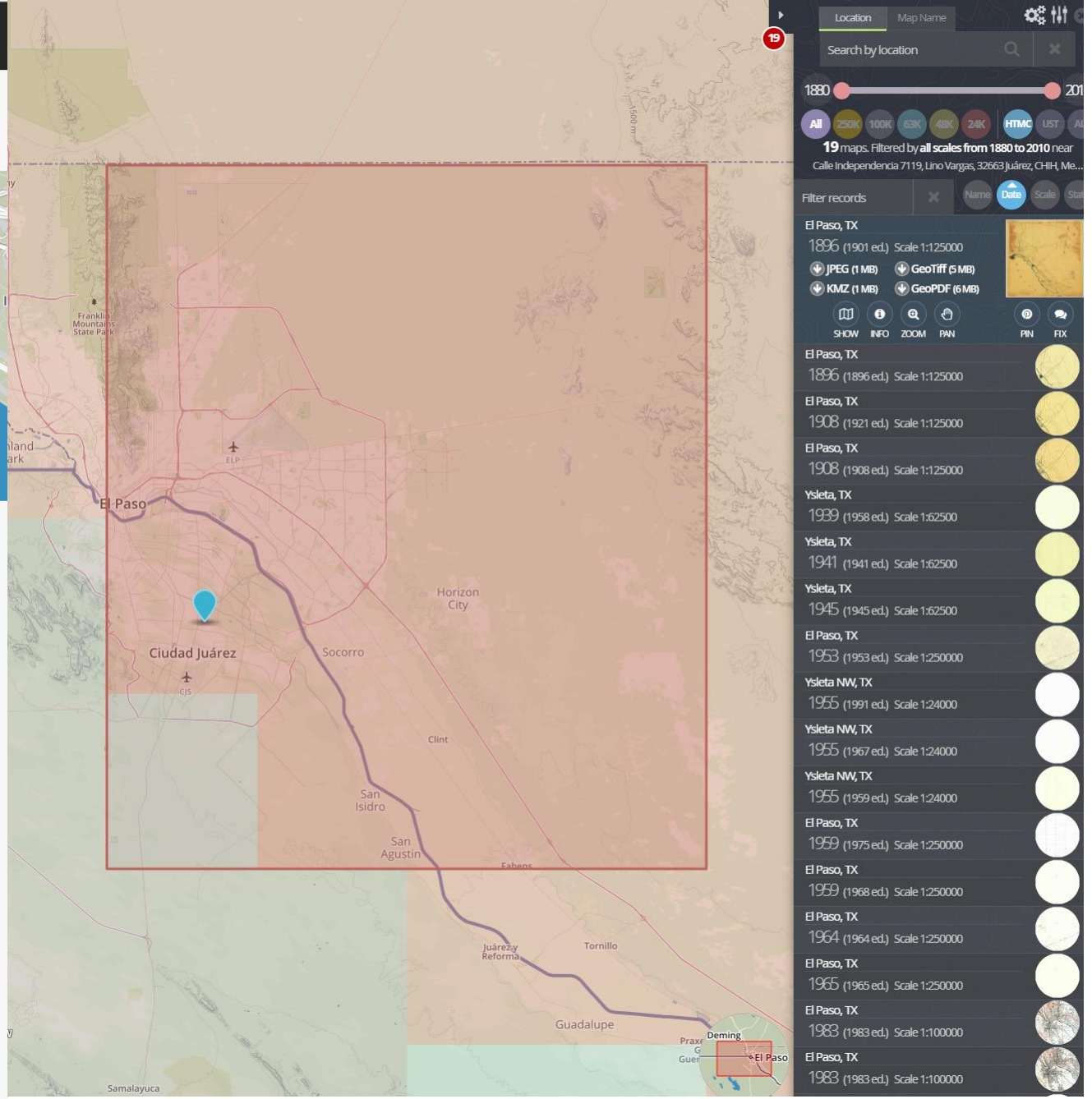
Download maps now through topoView

Learn more about the **NGMDB** project

Want to see more? Check out our **video demo**

In cooperation with **The National Map**

Have questions? See our **FAQ's** section for answers



Where do you get geospatial data? 2

¿Dónde obtienes datos geoespaciales? 2

Geospatial data are also easily created, through:

- field-based data collection (e.g., GPS)
- georeferencing scanned historic maps and imagery
- digitizing features from basemaps
- submitting to VGI – volunteered geographic information platforms (e.g., Open Street Map, Mapillary, etc.)

Los datos geoespaciales también se pueden crear fácilmente, a través de:

- *recolección de datos basados en el campo (por ejemplo, GPS)*
- *georreferenciación exploró mapas históricos e imágenes*
- *digitalización de características de mapas base*
- *Enviar a VGI - plataformas voluntarias de información geográfica (por ejemplo, Open Street Map, Mapillary, etc.)*

Downtown Miami (1924) Georeferenced Aerial Photos

Santiago chile Go

Search Results

Results from OpenStreetMap Nominatim

Village El Chile, Departamento de La Paz, El Salvador

More results

Results from GeoNames

Santiago , Chile

Puente Alto , Chile

San Bernardo , Chile

Santiago Metropolitan , Chile

La Pintana , Chile

Lo Prado , Chile

Peñaflor , Chile

Los Cerrillos Airport , Chile

Melipilla , Chile

Talagante , Chile

Buin , Chile

Provincia de Santiago , Chile

Santiago Chicureo Airport , Chile

Comodoro Arturo Merino Benítez International Airport , Chile

Lampa Lipangui Airport , Chile

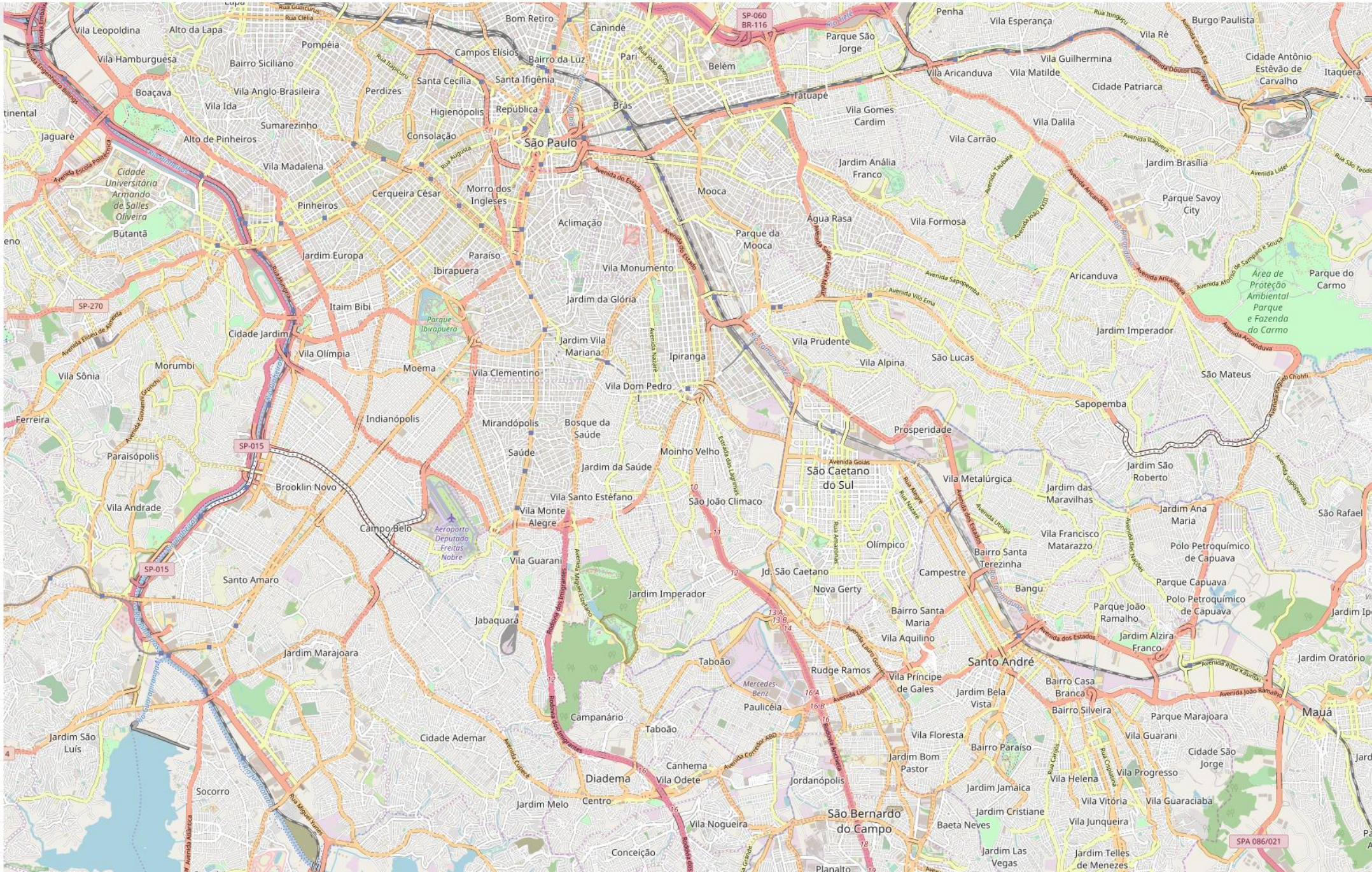
Eulogio Sánchez Airport , Chile

Paine , Chile

Provincia de Melipilla , Chile

Provincia de Maipo , Chile

Cerro Juncal , Chile



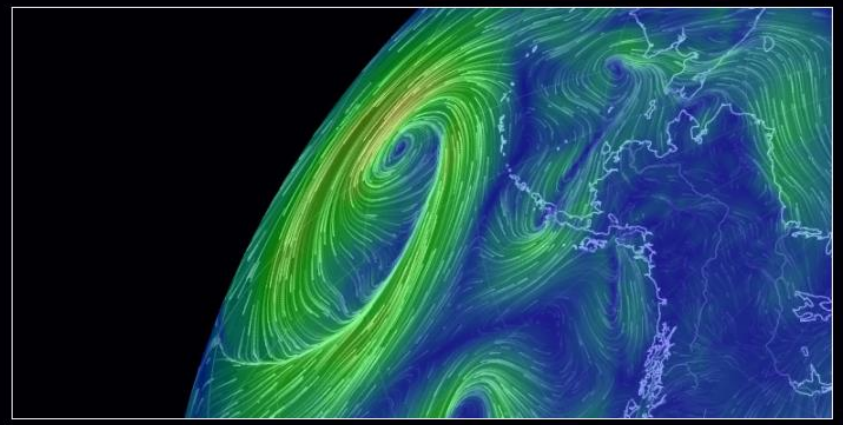
What can you do with geospatial data?

¿Qué se puede hacer con los datos geoespaciales?

- Land use / land cover change
- *Cambio de uso de la tierra / cobertura de la tierra*
- Urbanization and urban management
- *Urbanización y gestión urbana*
- Resource management
- *Administracion de recursos*
- Navigation and network analysis
- *Navegación y análisis de redes*
- Natural hazards
- *Peligros Naturales*
- Real estate and business analysis
- *Análisis inmobiliario y comercial*
- Environmental modelling
- *Modelado ambiental*

And much, much more . . .

Y mucho, mucho más . . .



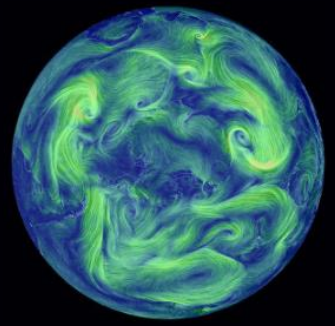
earth

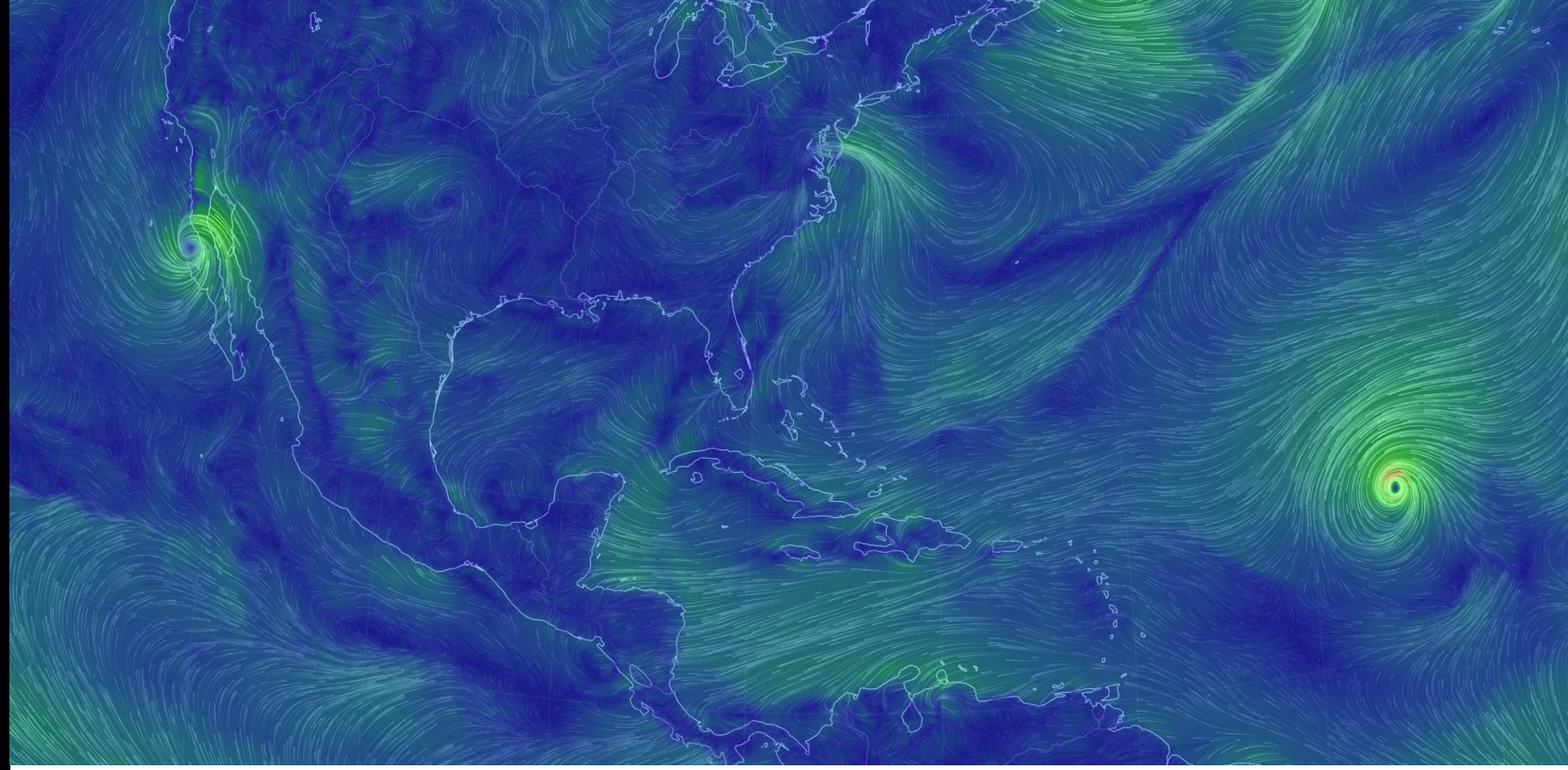
a visualization of global weather conditions
forecast by supercomputers
updated every three hours

ocean surface current estimates
updated every five days

ocean surface temperatures and
anomaly from daily average (1981-2011)
updated daily

ocean waves
updated every three hours

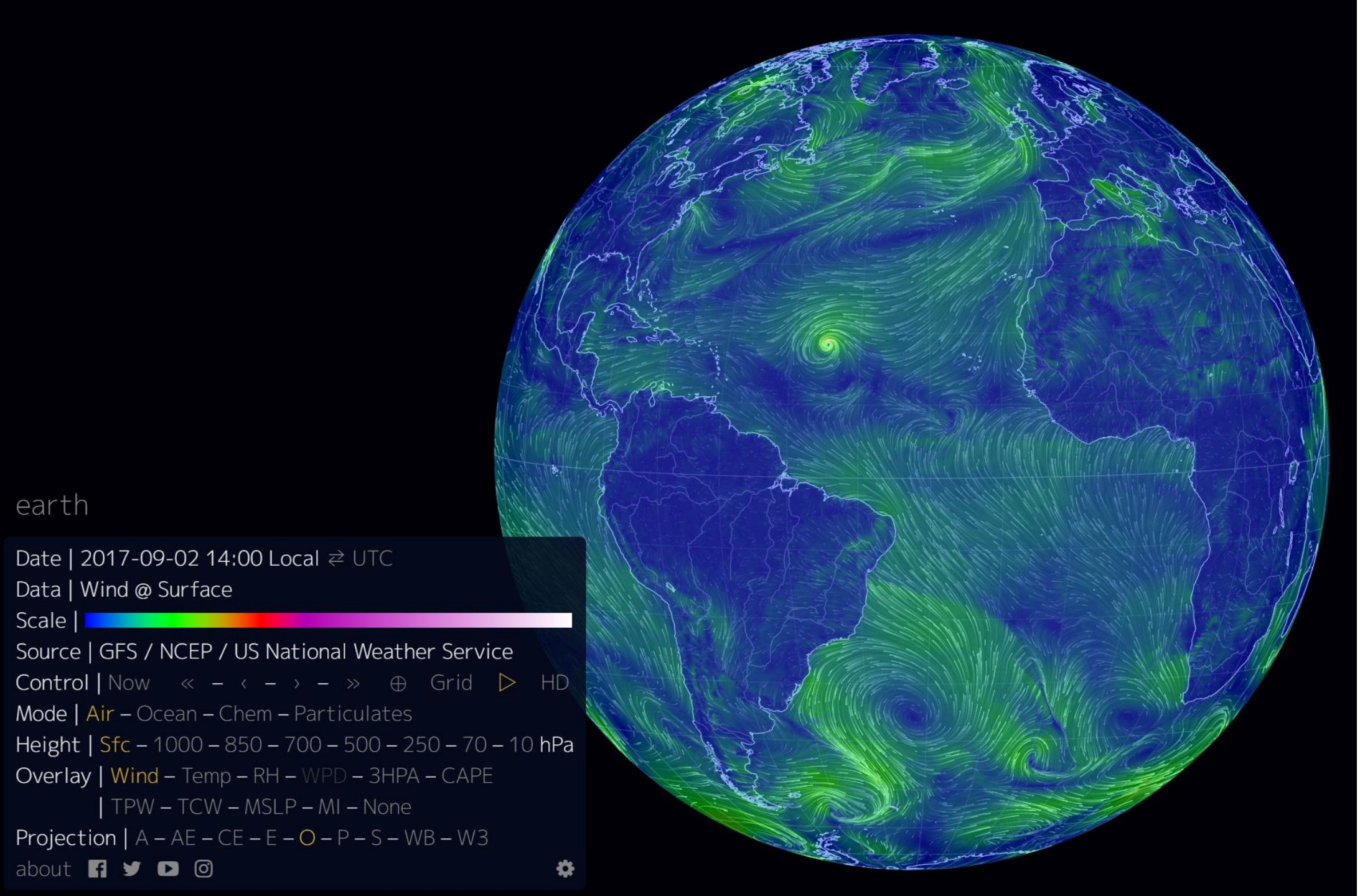




Cameron Beccario's

@cambee [Twitter]

earth.nullschool.net



Cameron Beccario's
@cambee [Twitter]

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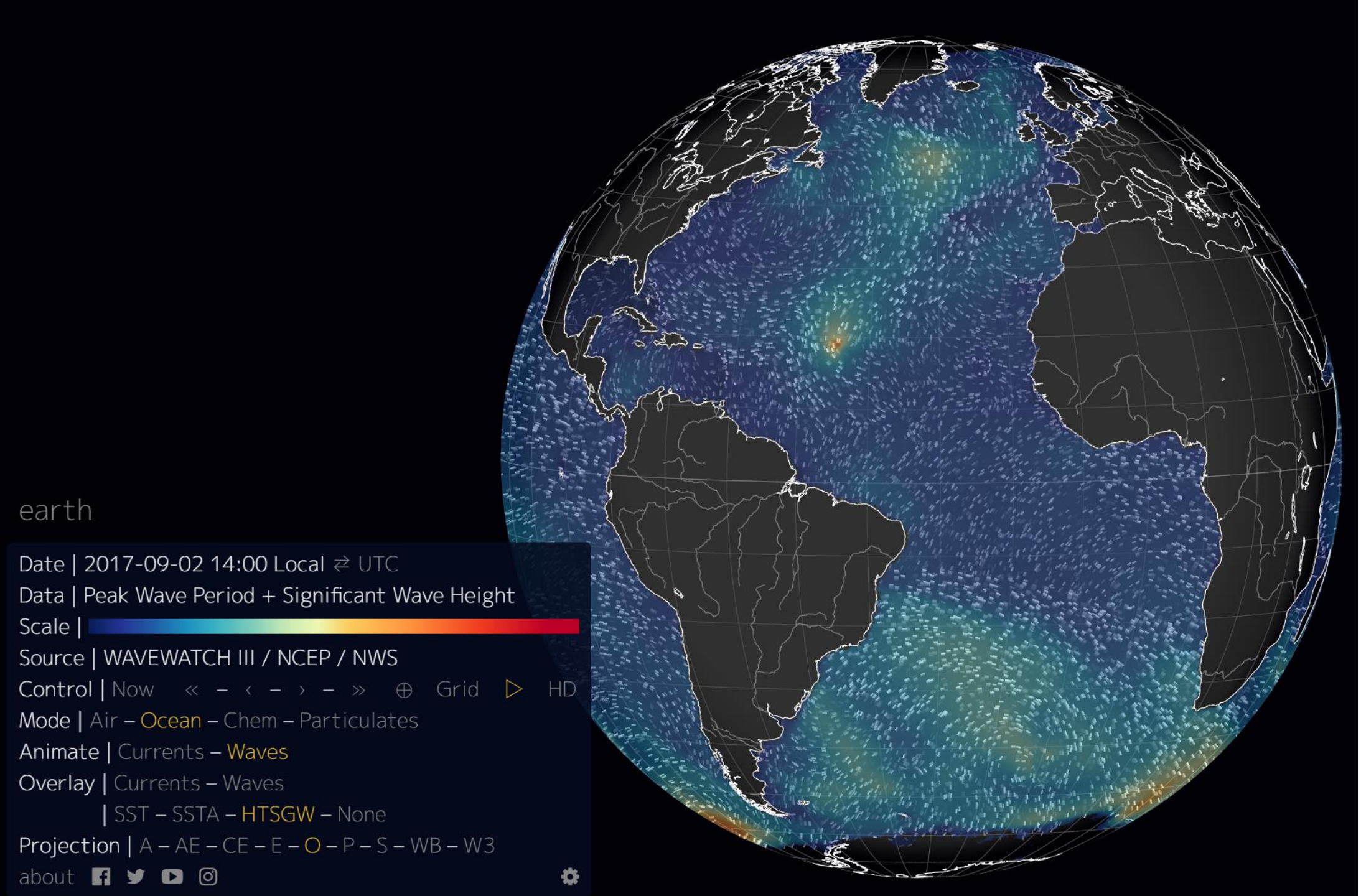
Wind Speed



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ocean significant wave height

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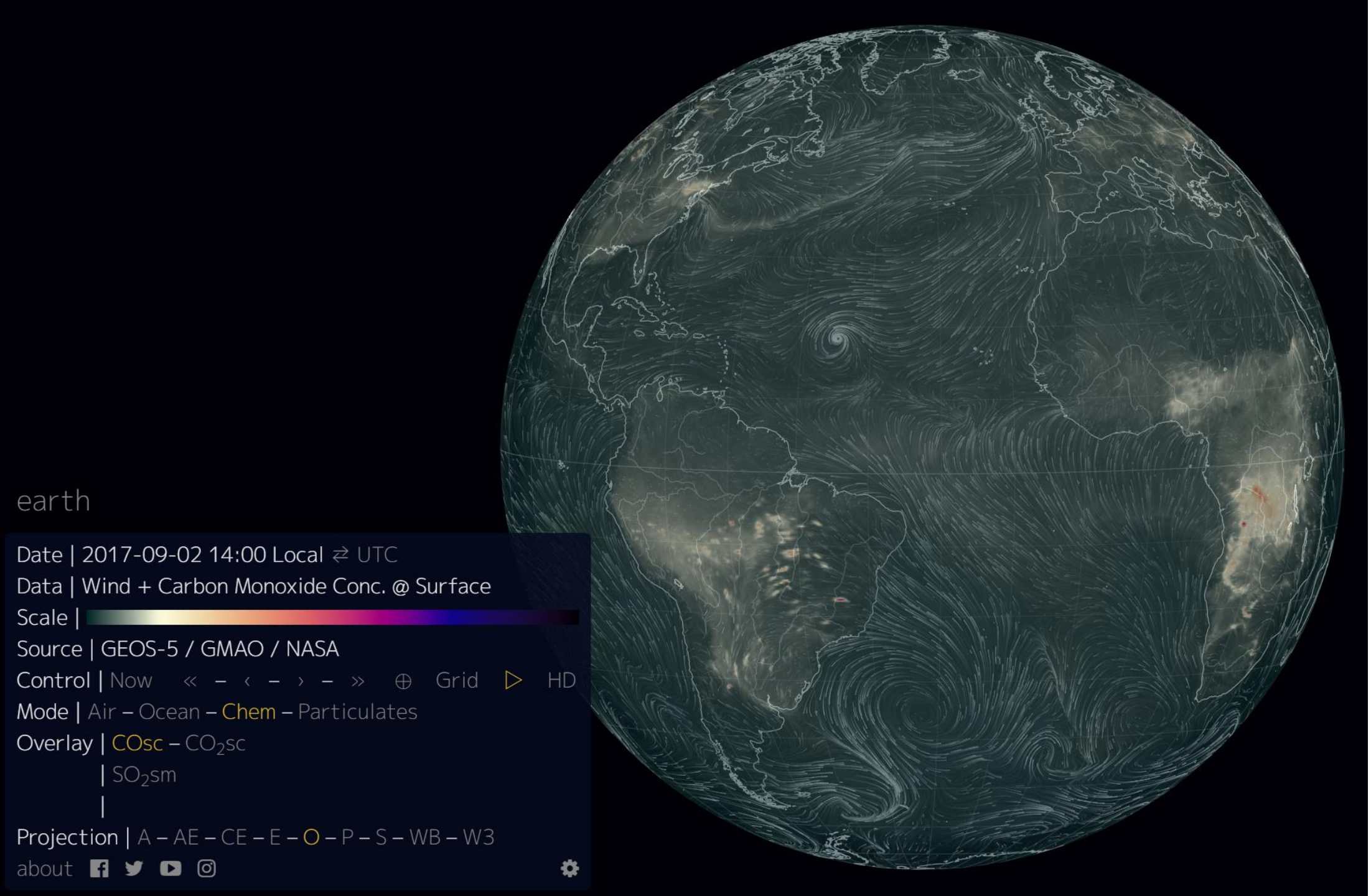
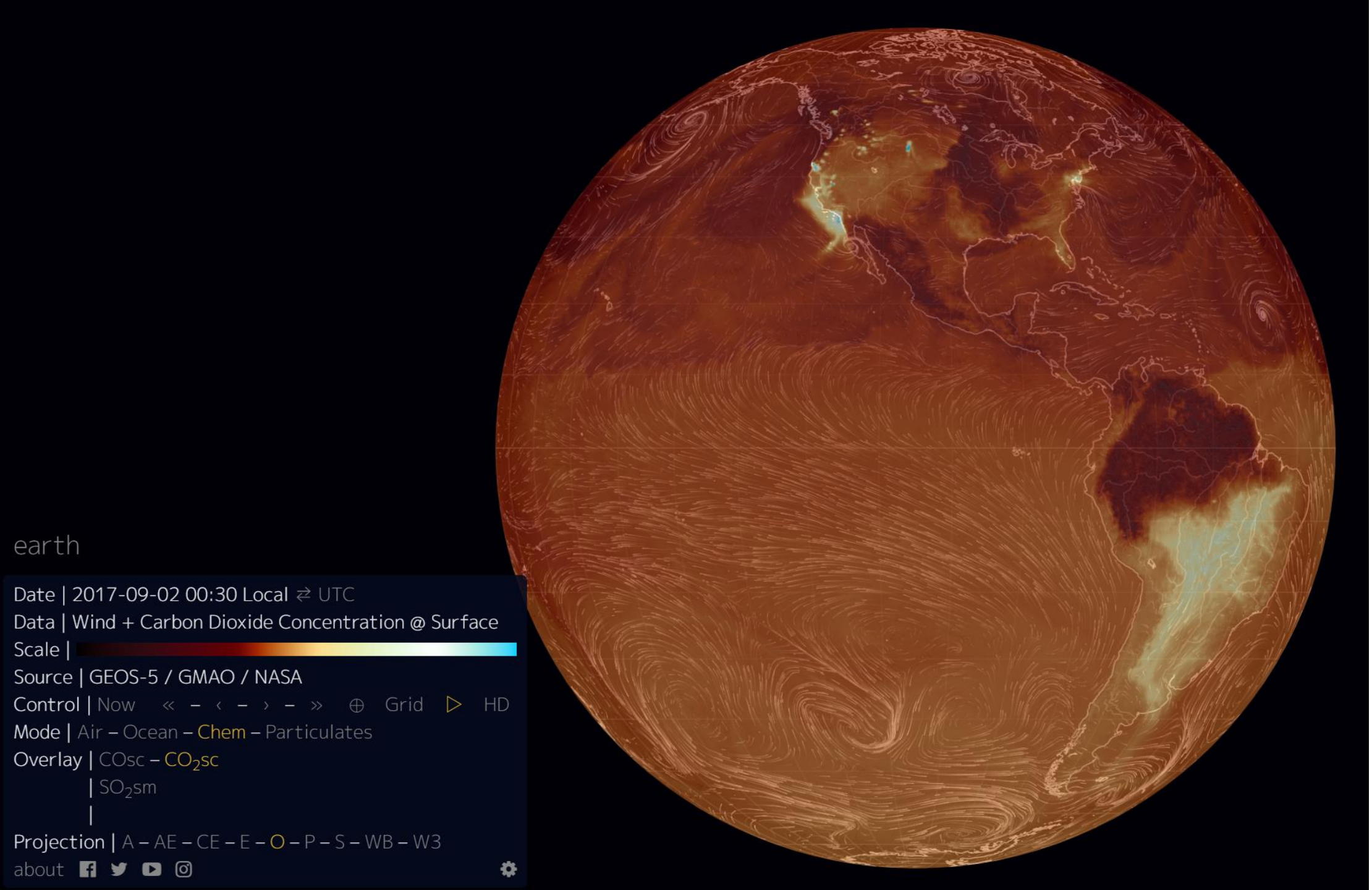
Carbon Monoxide Surface Concentrate

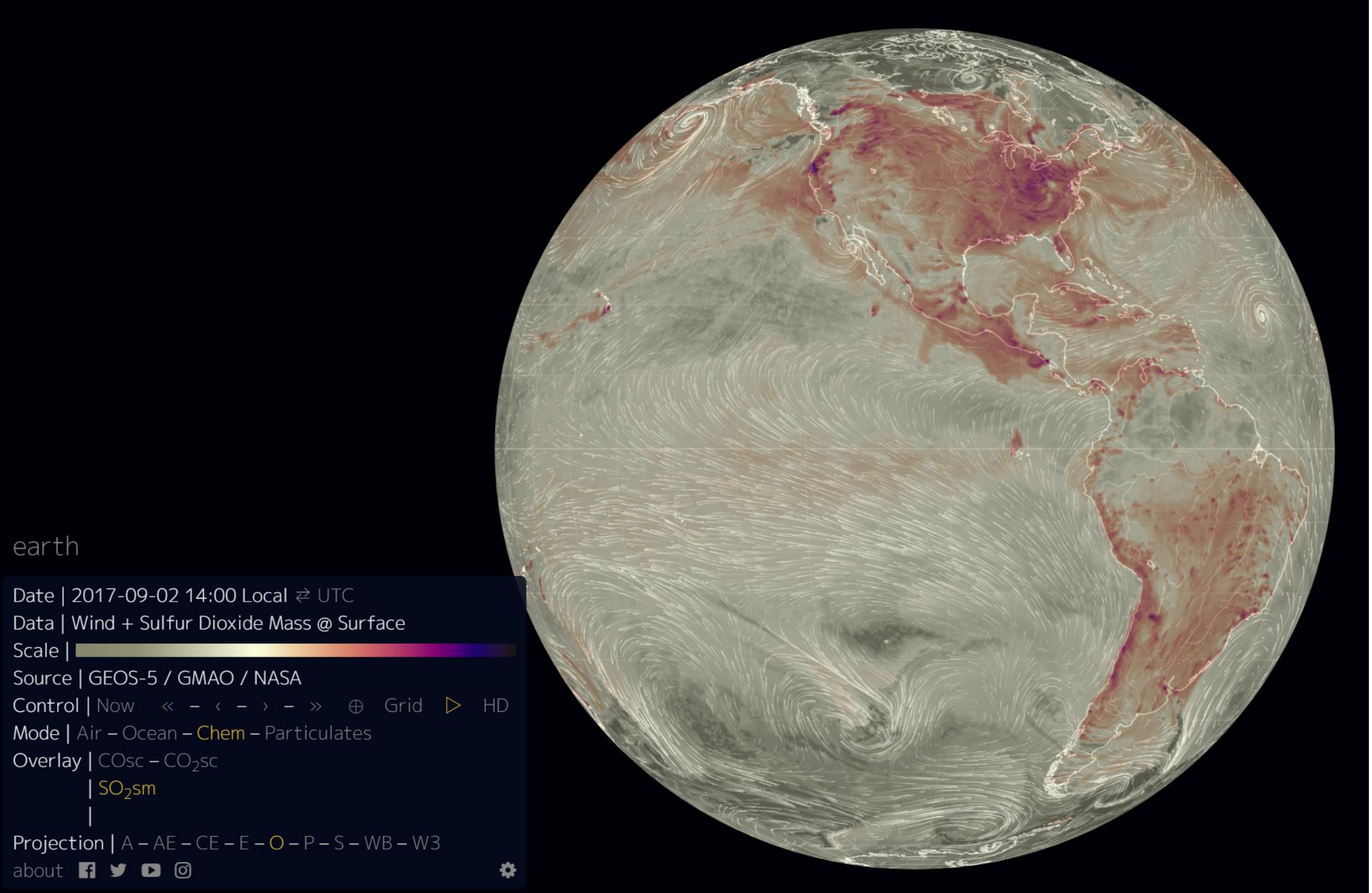




Cameron Beccario's
@cambee [Twitter]

earth.nullschool.net

Carbon Dioxide CO_2 Surface Concentration



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Sulfur Dioxide SO_2 Surface Mass

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@cambee [Twitter]

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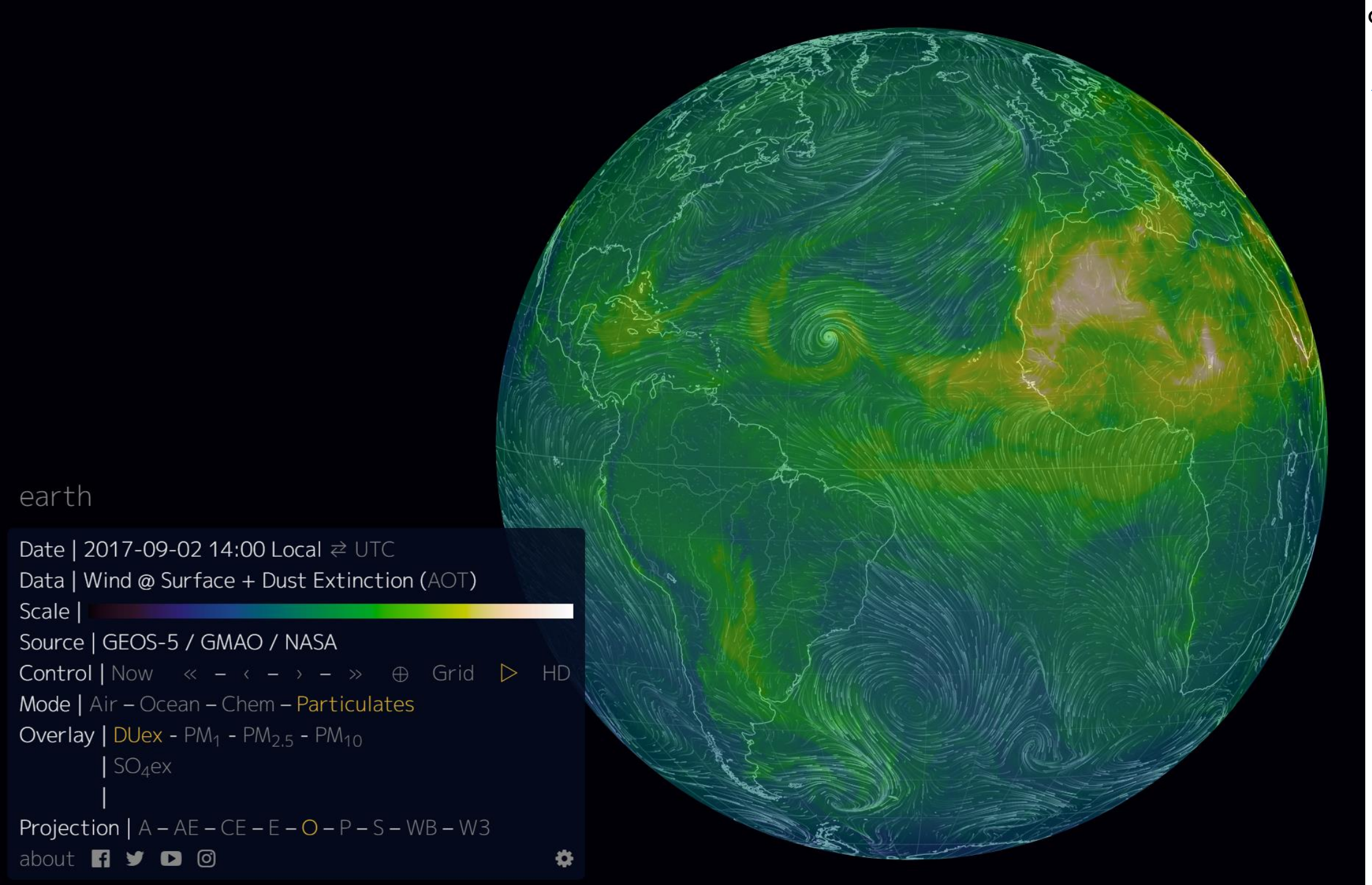
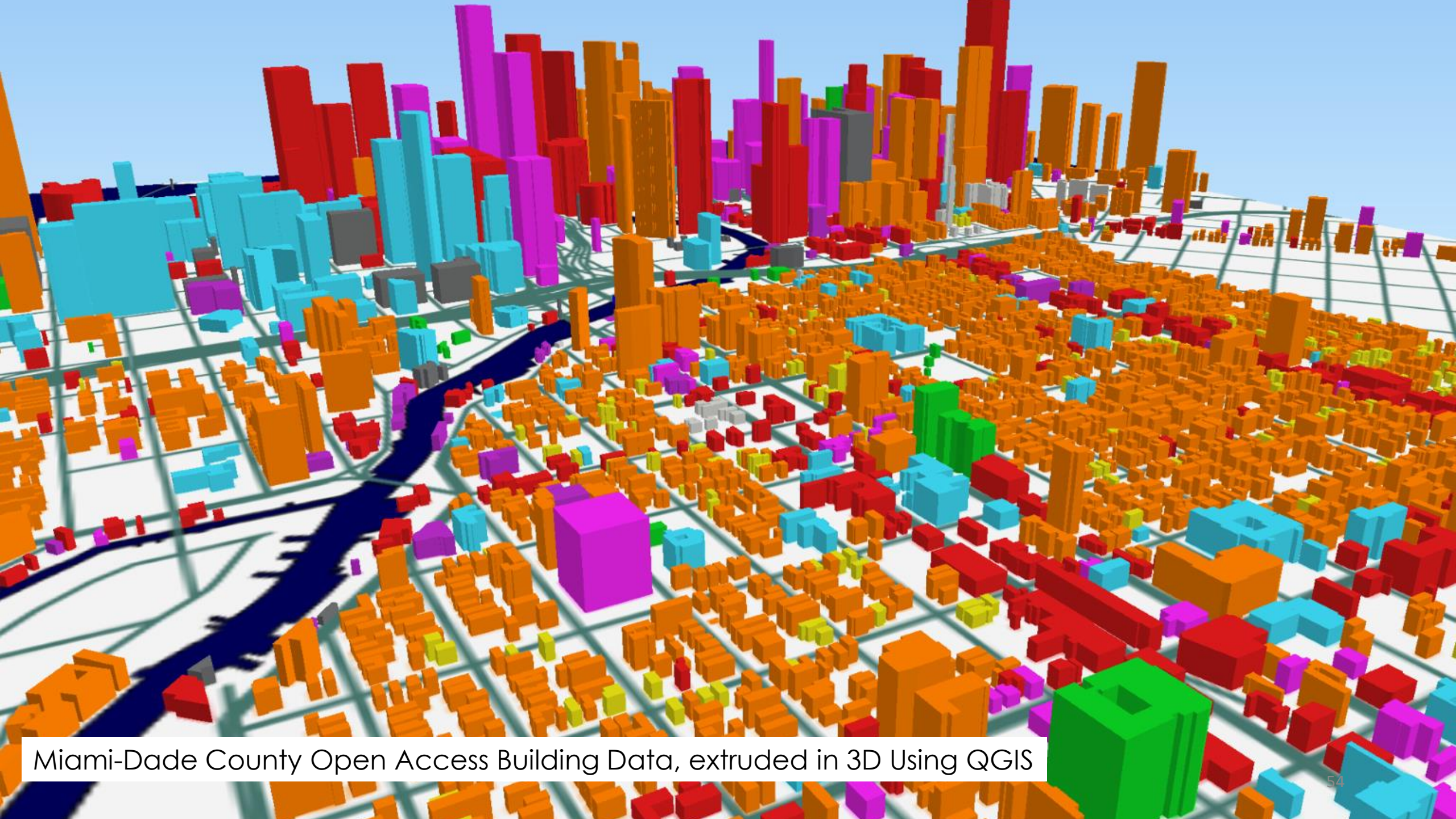
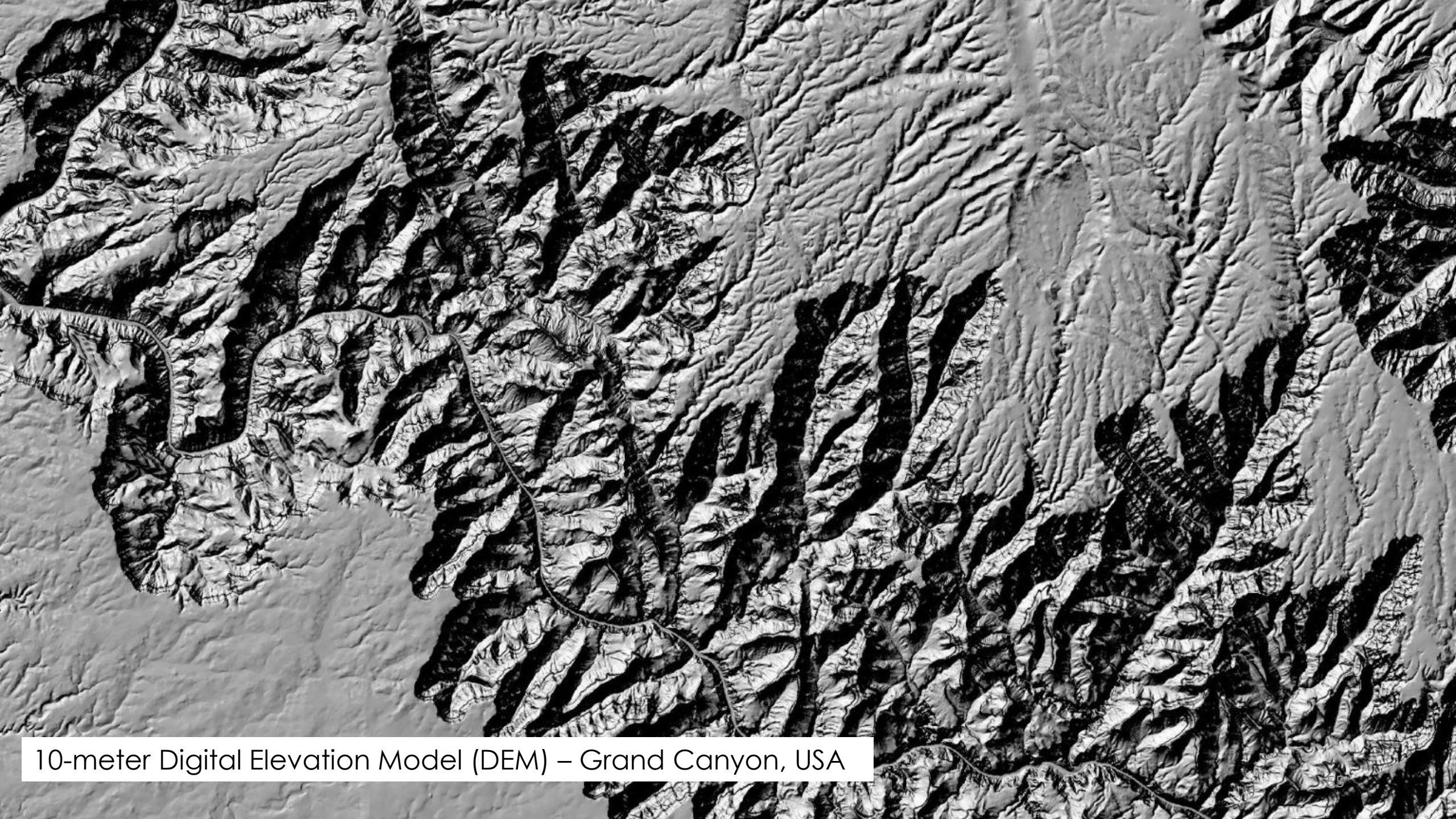


Dust Extinction



Miami-Dade County Open Access Building Data, extruded in 3D Using QGIS



10-meter Digital Elevation Model (DEM) – Grand Canyon, USA

Coordinate Reference Systems

The most common coordinate reference system we are all familiar with is the system of latitude and longitude.

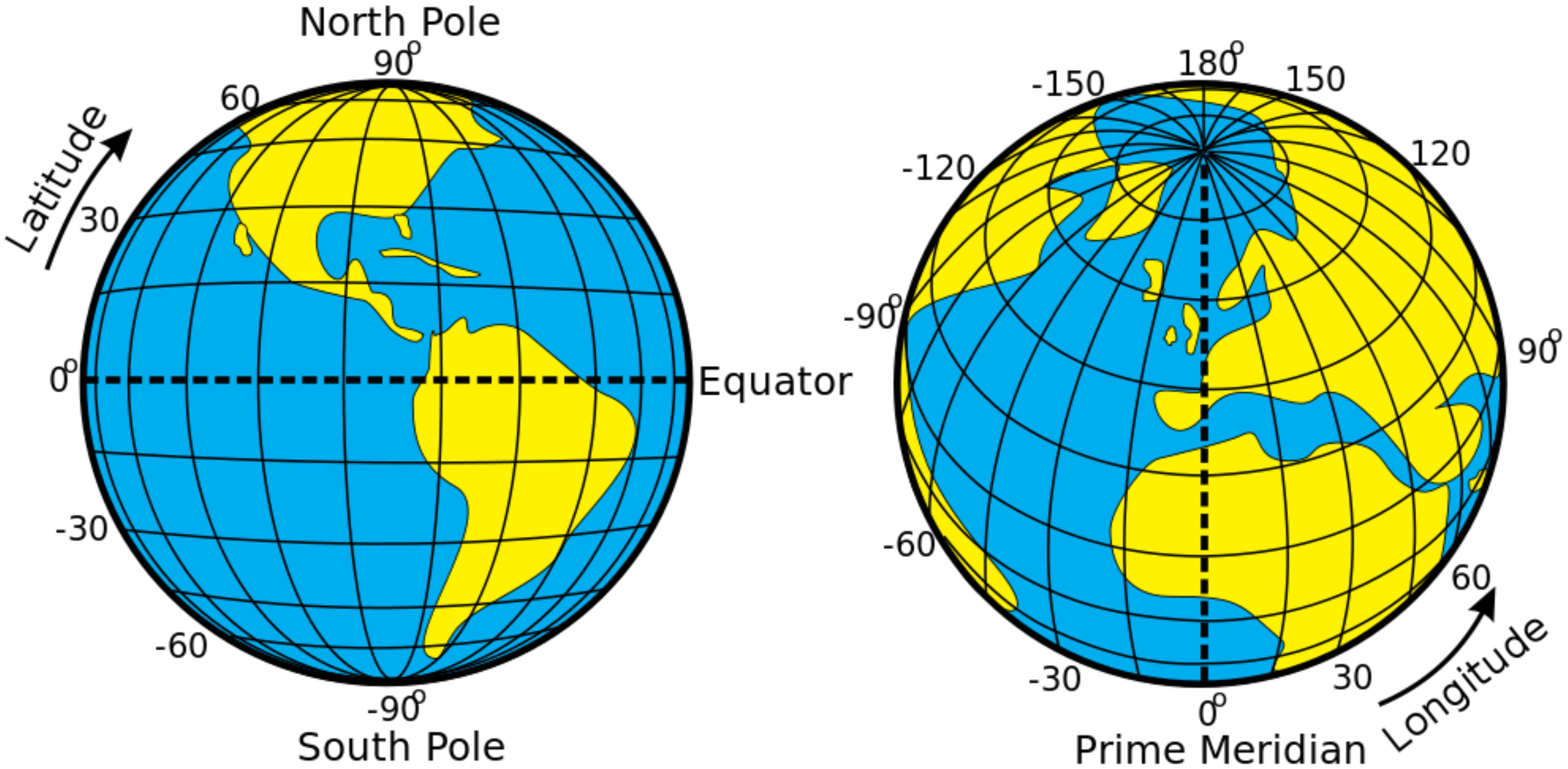
El sistema de referencia de coordinadas más común con el que todos estamos familiarizados es el sistema de latitud y longitud.

We measure angles north and south from the equator with latitude – 0 to 90 degrees north or south.

Medimos los ángulos norte y sur desde el ecuador con latitud - 0 a 90 grados norte o sur.

We measure distances east and west from the prime meridian (in Greenwich, England) with longitude – 0 to 180 degrees east or west.

Medimos distancias este y oeste desde el meridiano principal (en Greenwich, Inglaterra) con longitud - 0 a 180 grados este u oeste.


North Pole
90°
60
Latitude
30
0°
Equator
-30
-60
-90°
South Pole
180°
-150
150
-120
120
-90°
90°
-60
60
-30
30
0°
Prime Meridian
Longitude

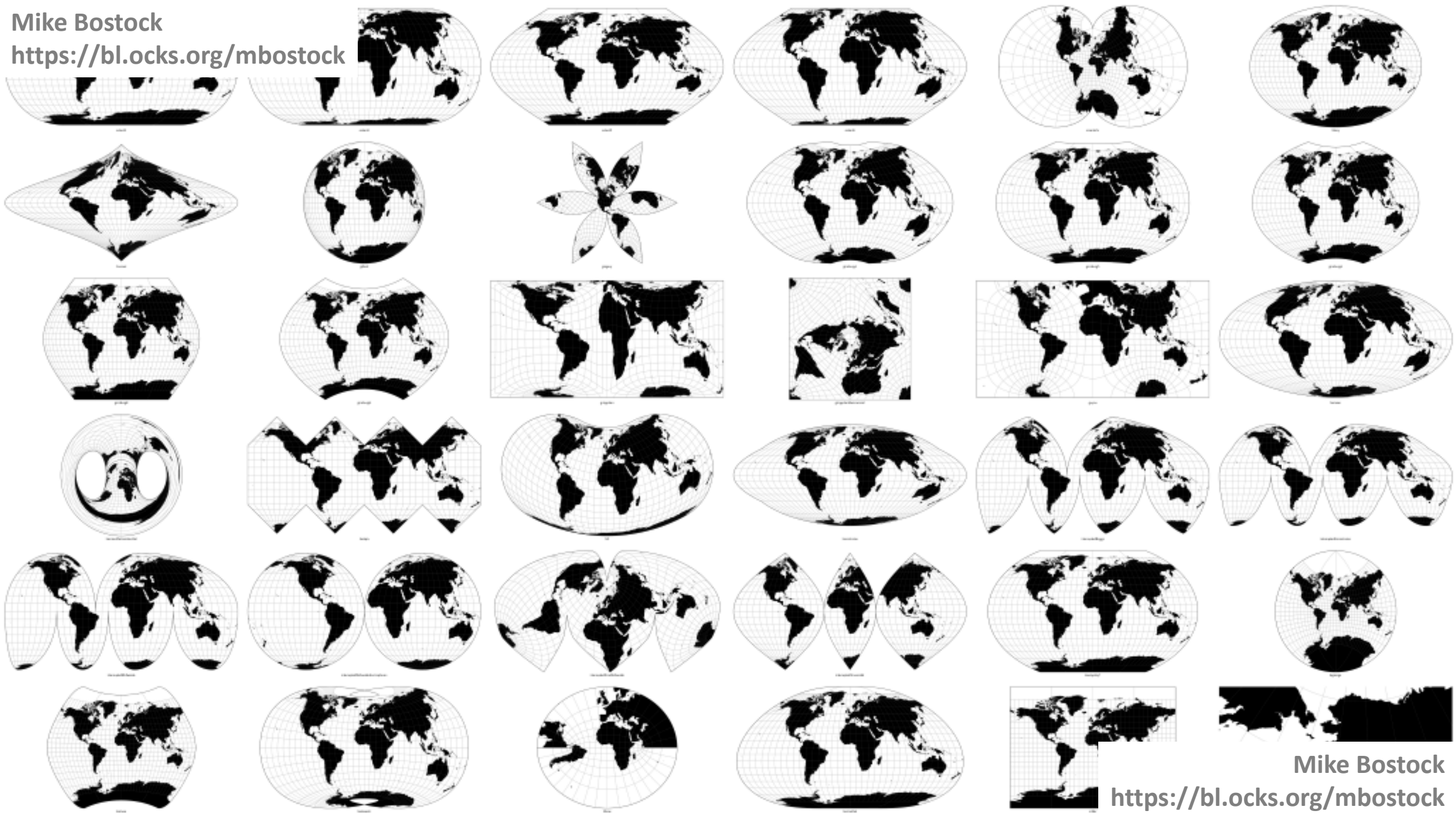
Coordinate Reference Systems

Thousands of coordinate reference systems (CRS) can be used to define location across geographic space.

Se pueden utilizar miles de sistemas de referencia de coordenidas (SRC) para definir la ubicación a través del espacio geográfico.

We often use a “projected” (flattened, planimetric) coordinate system when measurements or analysis is being done.

A menudo usamos un sistema de coordinadas "proyectado" (plano, planimétrico) cuando se realizan mediciones o análisis.



Mike Bostock
https://bl.ocks.org/mbostock

WHAT YOUR FAVORITE MAP PROJECTION SAYS ABOUT YOU

MERCATOR

YOU'RE NOT REALLY INTO MAPS.

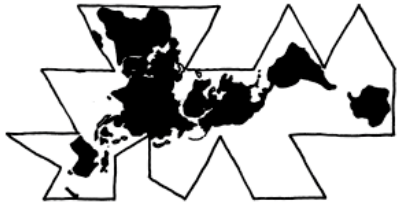
VAN DER GRINTEN

YOU'RE NOT A COMPLICATED PERSON. YOU LOVE THE MERCATOR PROJECTION; YOU JUST WISH IT WEREN'T SQUARE. THE EARTH'S NOT A SQUARE, IT'S A CIRCLE. YOU LIKE CIRCLES. TODAY IS GONNA BE A GOOD DAY!

ROBINSON

YOU HAVE A COMFORTABLE PAIR OF RUNNING SHOES THAT YOU WEAR EVERYWHERE. YOU LIKE COFFEE AND ENJOY THE BEATLES. YOU THINK THE ROBINSON IS THE BEST-LOOKING PROJECTION, HANDS DOWN.

DYMAXION



YOU LIKE ISAAC ASIMOV, XML, AND SHOES WITH TOES. YOU THINK THE SEGWAY GOT A BAD RAP. YOU OWN 3D GOGGLES, WHICH YOU USE TO VIEW ROTATING MODELS OF BETTER 3D GOGGLES. YOU TYPE IN DVORAK.

WINKEL-TRIPEL

NATIONAL GEOGRAPHIC ADOPTED THE WINKEL-TRIPEL IN 1998, BUT YOU'VE BEEN A W-T FAN SINCE *LONG* BEFORE "NAT GEO" SHOWED UP. YOU'RE WORRIED IT'S GETTING PLAYED OUT, AND ARE THINKING OF SWITCHING TO THE KAVRAYSKIY. YOU ONCE LEFT A PARTY IN DISGUST WHEN A GUEST SHOWED UP WEARING SHOES WITH TOES. YOUR FAVORITE MUSICAL GENRE IS "POST-".

GOODE HOMOLOSINE

THEY SAY MAPPING THE EARTH ON A 2D SURFACE IS LIKE FLATTENING AN ORANGE PEEL, WHICH SEEMS EASY ENOUGH TO YOU. YOU LIKE EASY SOLUTIONS. YOU THINK WE WOULDN'T HAVE SO MANY PROBLEMS IF WE'D JUST ELECT *NORMAL* PEOPLE TO CONGRESS INSTEAD OF POLITICIANS. YOU THINK AIRLINES SHOULD JUST BUY FOOD FROM THE RESTAURANTS NEAR THE GATES AND SERVE *THAT* ON BOARD. YOU CHANGE YOUR CAR'S OIL, BUT SECRETLY WONDER IF YOU REALLY *NEED* TO.

HOBO-DYER

YOU WANT TO AVOID CULTURAL IMPERIALISM, BUT YOU'VE HEARD BAD THINGS ABOUT GALL-PETERS. YOU'RE CONFLICT-AVERSE AND BUY ORGANIC. YOU USE A RECENTLY-INVENTED SET OF GENDER-NEUTRAL PRONOUNS AND THINK THAT WHAT THE WORLD NEEDS IS A REVOLUTION IN CONSCIOUSNESS.

A GLOBE!

YES, YOU'RE VERY CLEVER.

PEIRCE QUINCUNCIAL

YOU THINK THAT WHEN WE LOOK AT A MAP, WHAT WE REALLY SEE IS OURSELVES. AFTER YOU FIRST SAW *INCEPTION*, YOU SAT SILENT IN THE THEATER FOR SIX HOURS. IT FREAKS YOU OUT TO REALIZE THAT EVERYONE AROUND YOU HAS A SKELETON INSIDE THEM. YOU *HAVE* REALLY LOOKED AT YOUR HANDS.

PLATE CARRÉE (EQUIRECTANGULAR)

YOU THINK THIS ONE IS FINE. YOU LIKE HOW X AND Y MAP TO LATITUDE AND LONGITUDE. THE OTHER PROJECTIONS OVERCOMPLICATE THINGS. YOU WANT ME TO STOP ASKING ABOUT MAPS SO YOU CAN ENJOY DINNER.

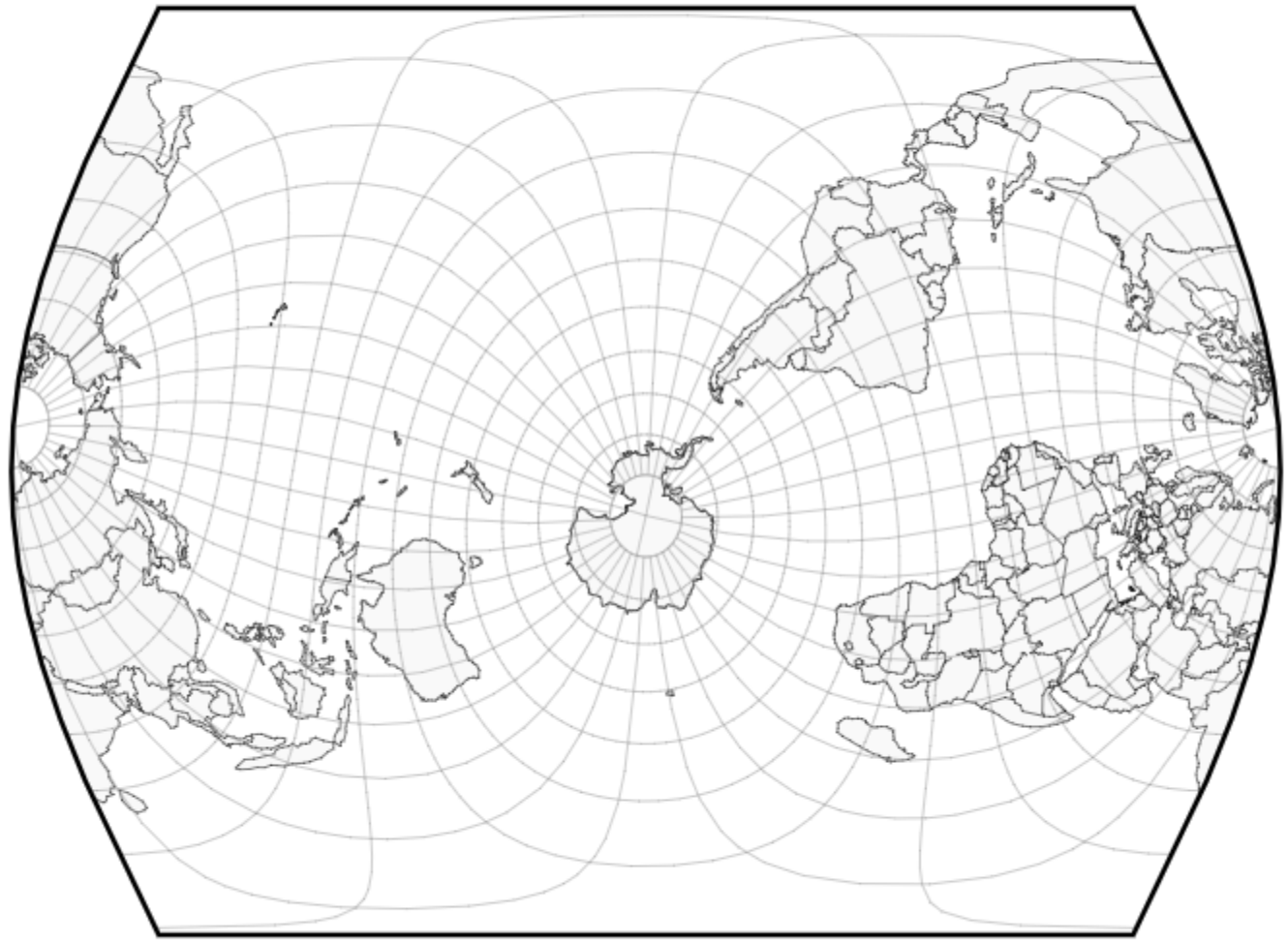
WATERMAN BUTTERFLY

REALLY? YOU KNOW THE WATERMAN? HAVE YOU SEEN THE 1909 CAHILL MAP IT'S BASED— ...YOU HAVE A FRAMED REPRODUCTION AT HOME?! WHOA. ...LISTEN, FORGET THESE QUESTIONS. ARE YOU DOING ANYTHING TONIGHT?

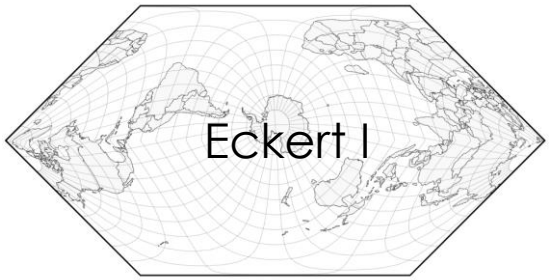
GALL-PETERS

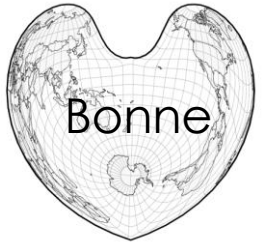
I *HATE* YOU.

Map Projection Transitions



Times ▾ Pause


Eckert I


Bonne

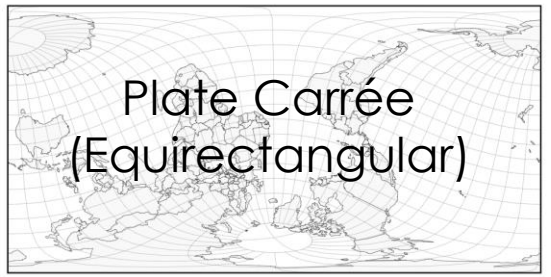
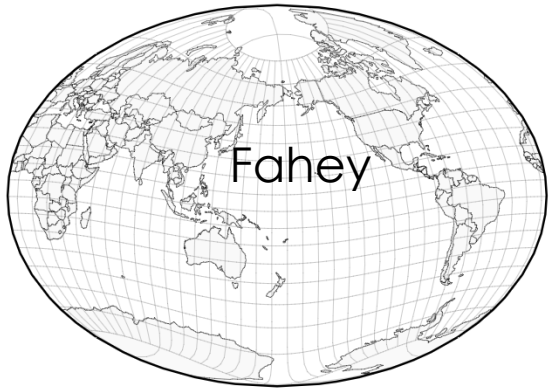
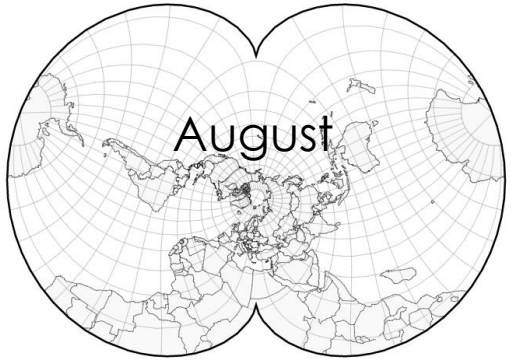
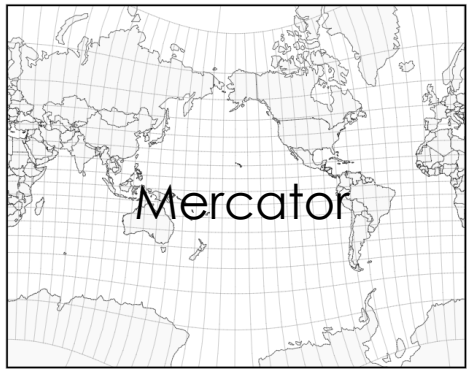


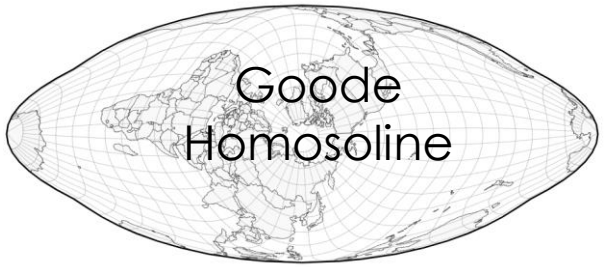
Plate Carrée
(Equirectangular)

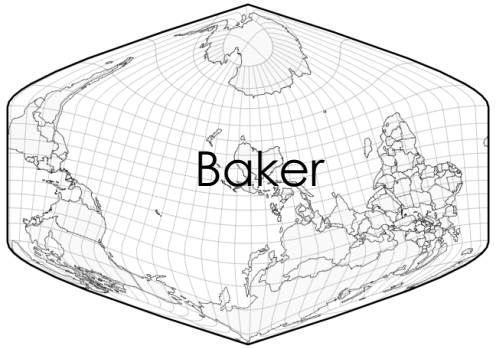

Fahey

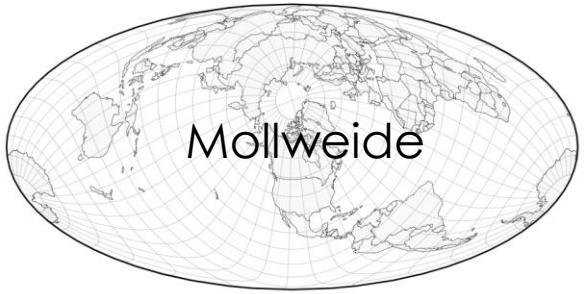

August

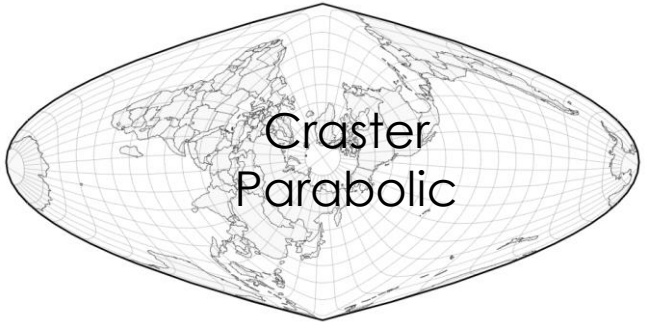

Mercator


Van der Grinten

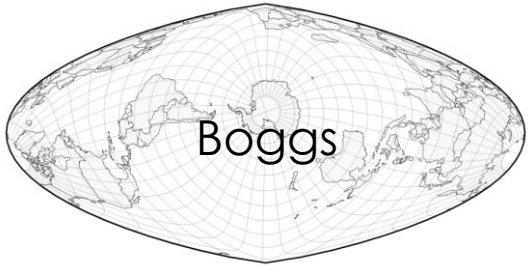

Goode
Homosoline

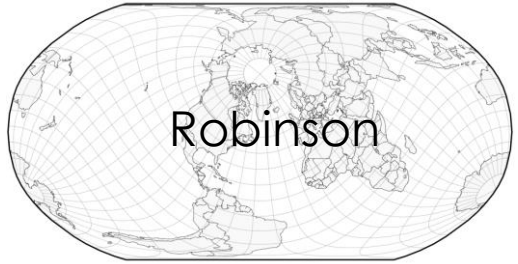

Baker

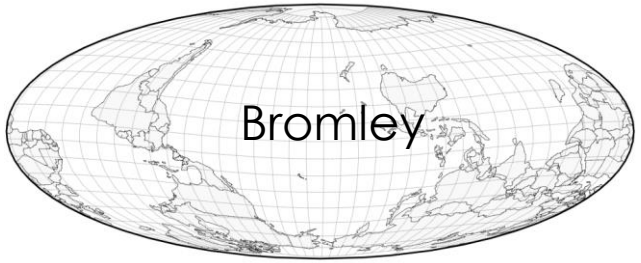

Mollweide

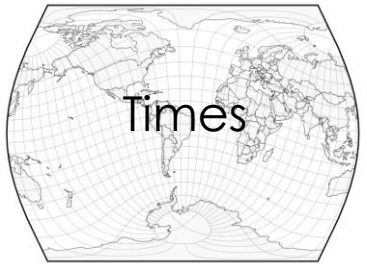

Craster
Parabolic


Laskowski


Boggs


Robinson

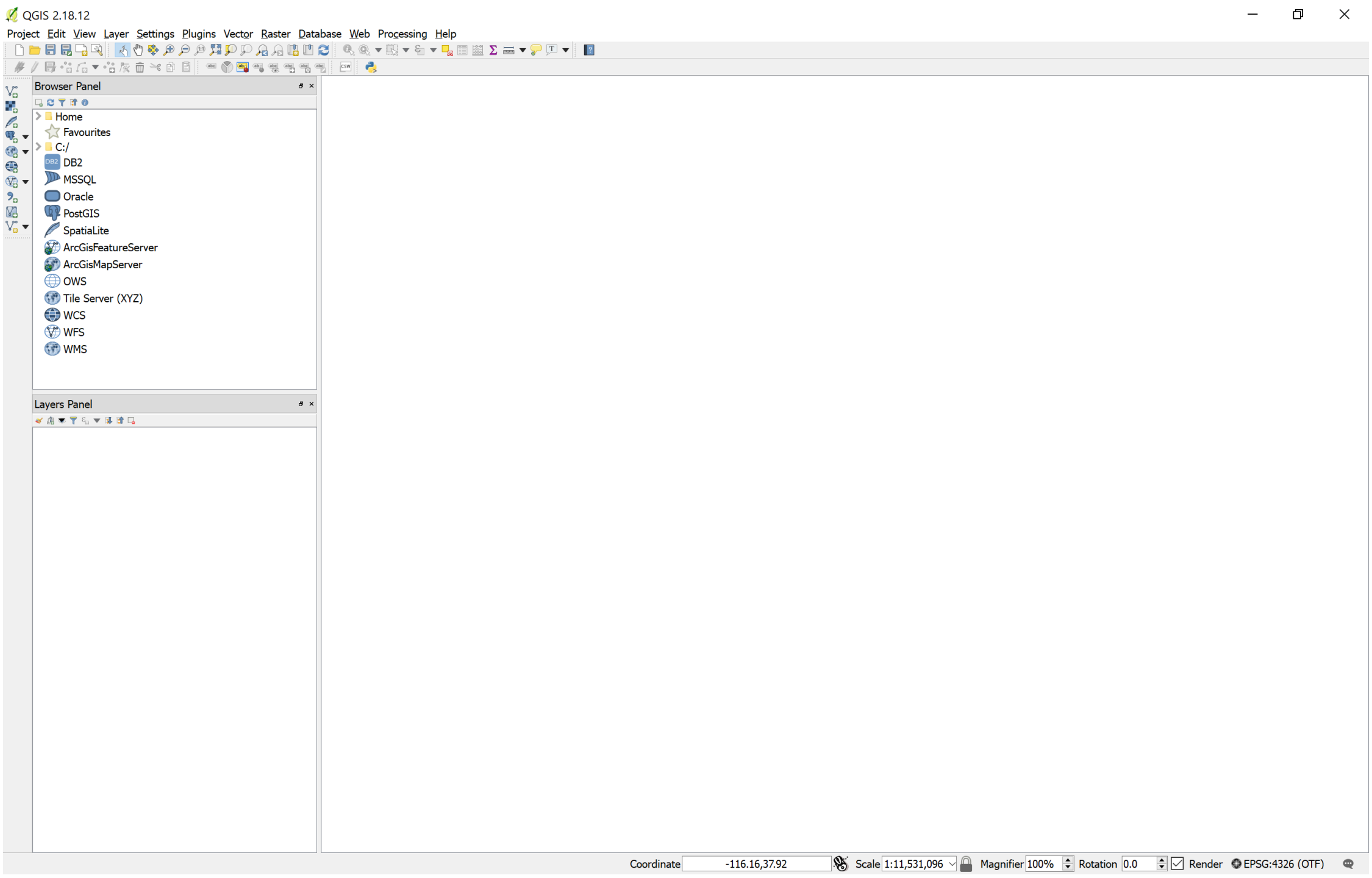

Bromley


Times

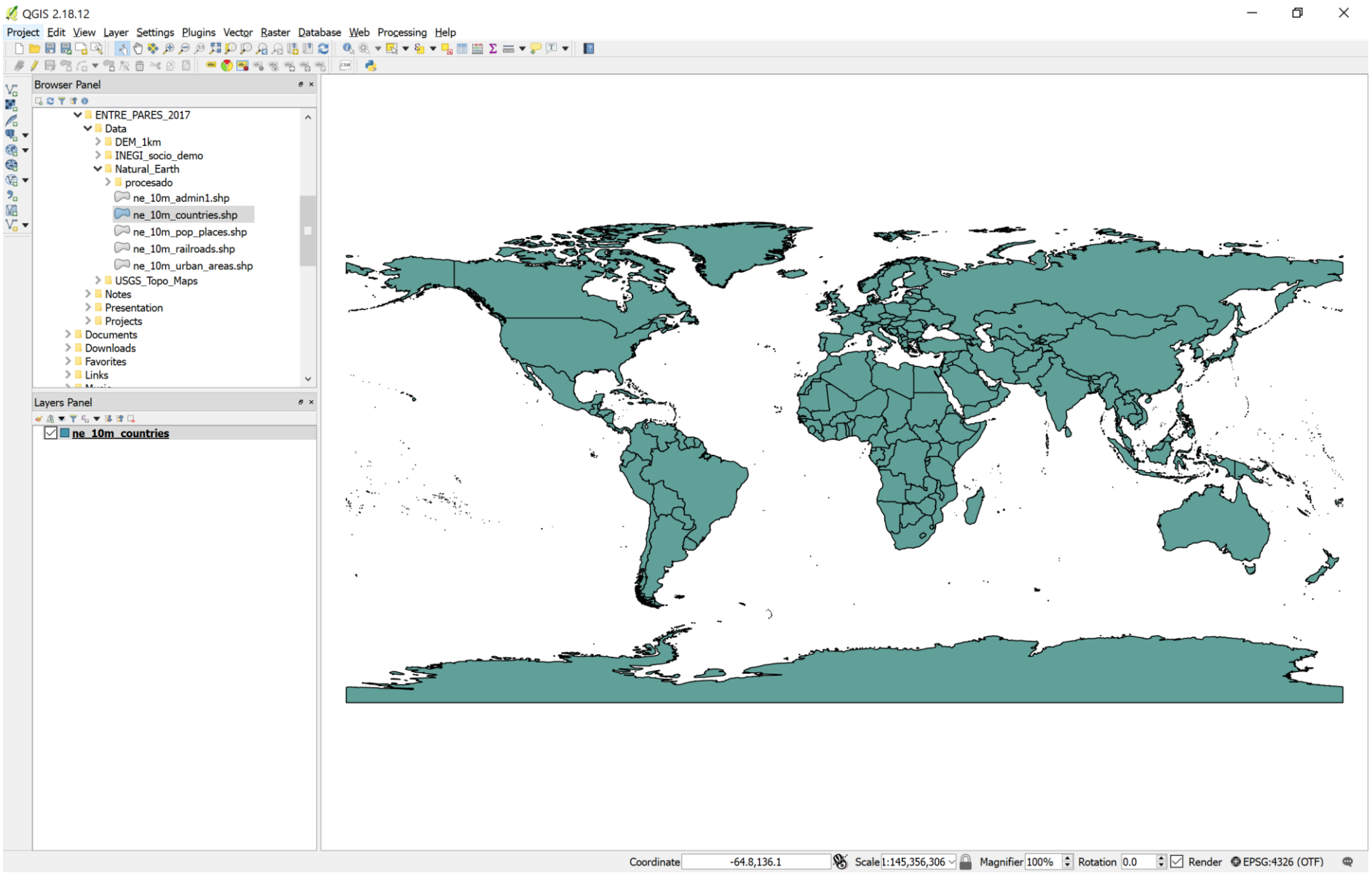
Let's begin to explore QGIS . . .

Comencemos a explorar QGIS. . .


QGIS

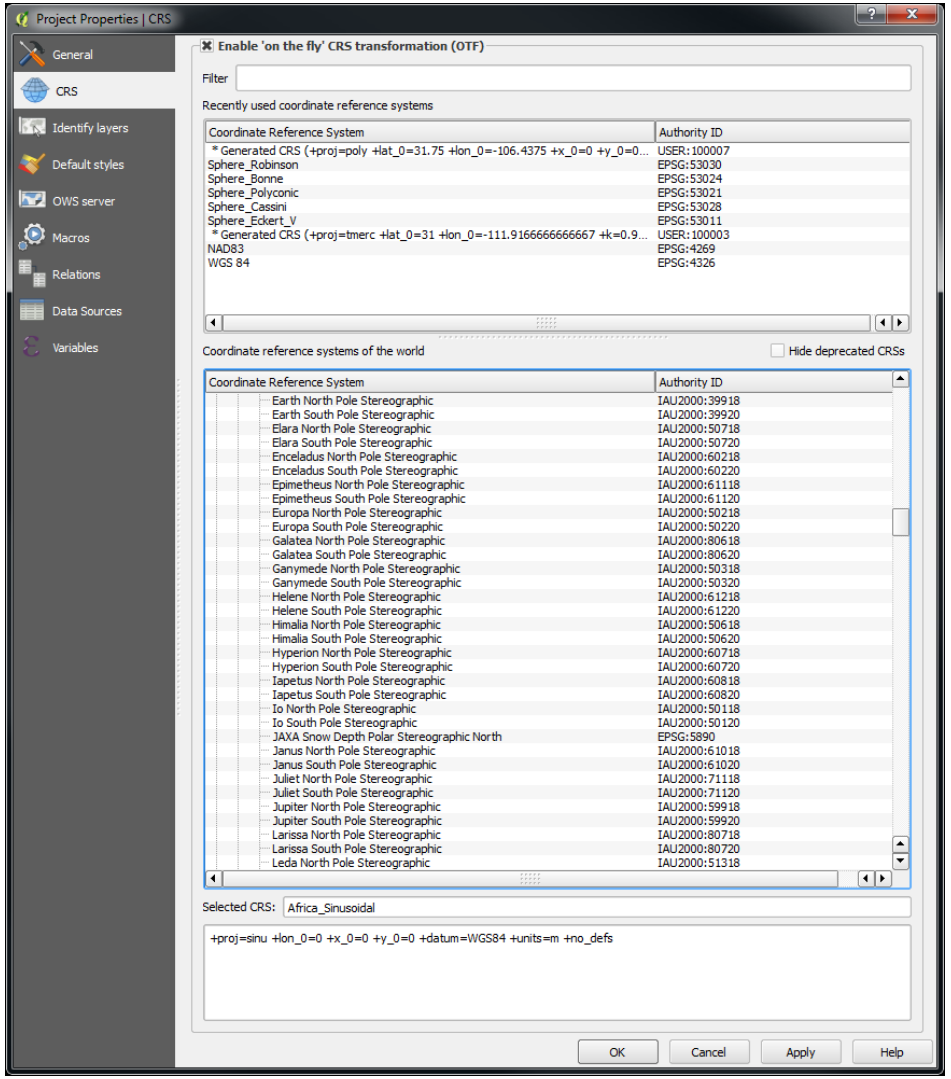

QGIS 2.18.12
Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Help
Browser Panel
Home
Favourites
C:/
DB2
MSSQL
Oracle
PostGIS
SpatiaLite
ArcGisFeatureServer
ArcGisMapServer
OWS
Tile Server (XYZ)
WCS
WFS
WMS
Layers Panel
Coordinate -116.16,37.92
Scale 1:11,531,096
Magnifier 100%
Rotation 0.0
Render
EPSG:4326 (OTF)

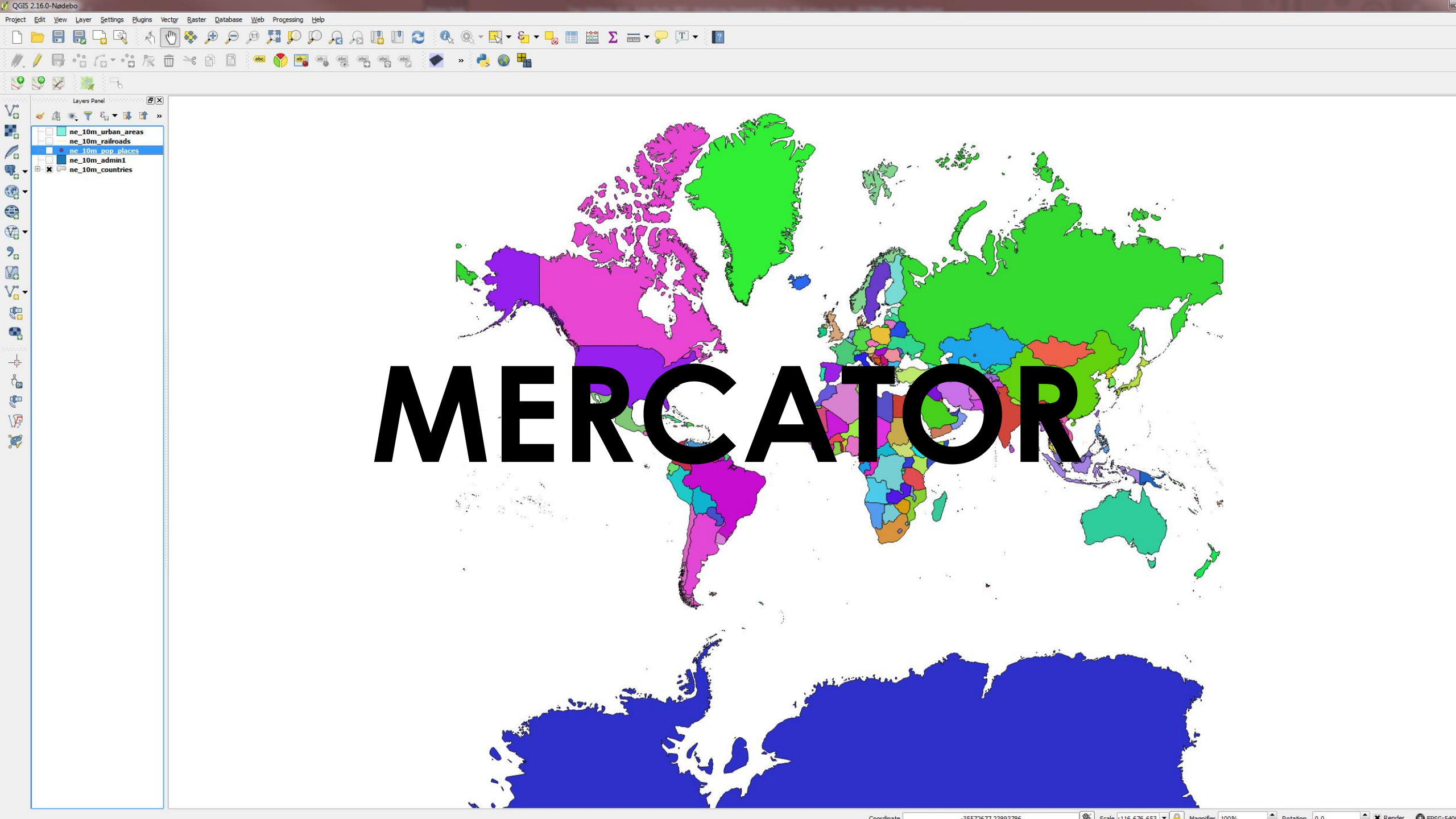
Add data . . . *Agregar Datos . . .*

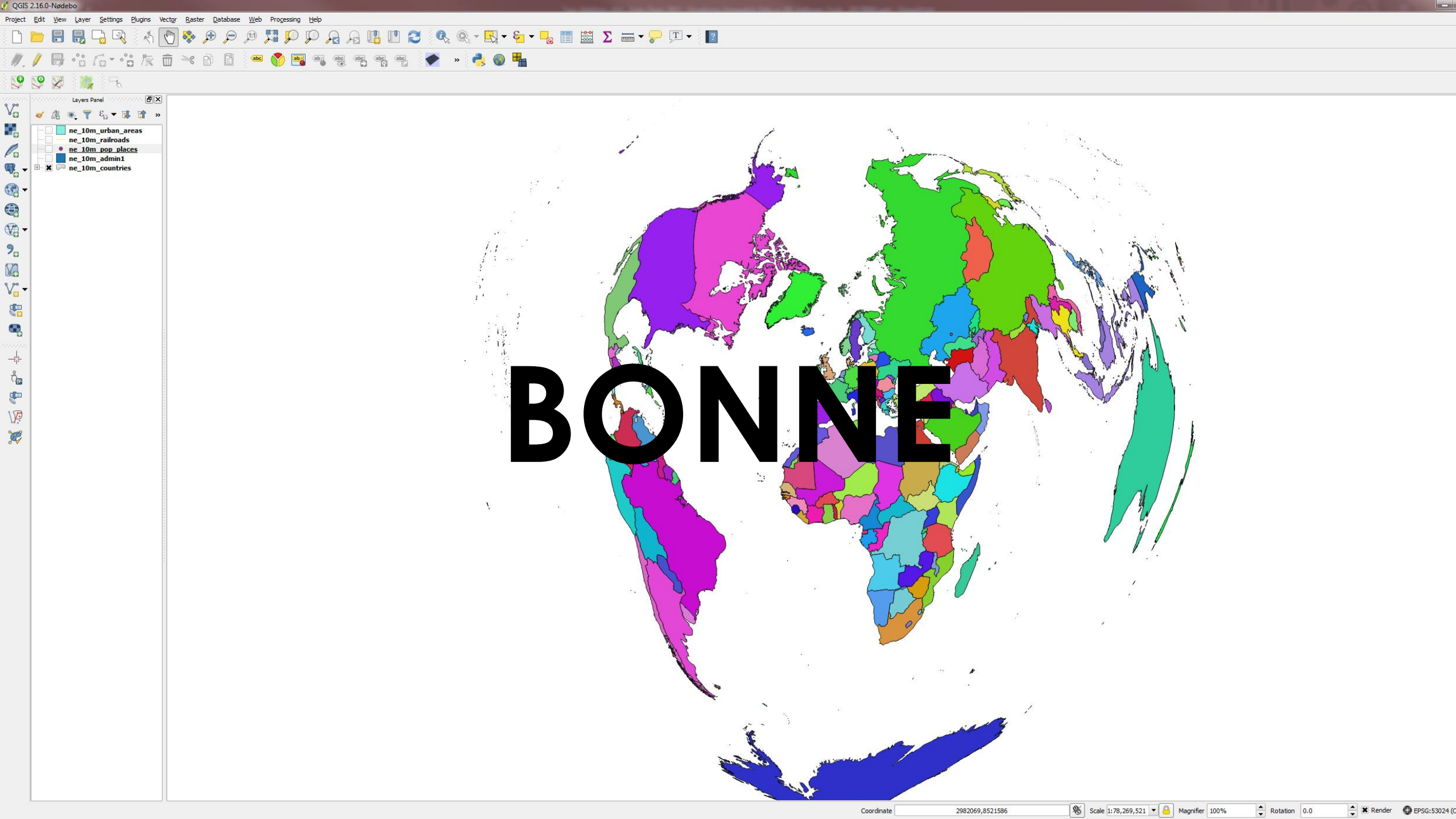


Change the Project's Projection . . .

Cambiar la Proyección del Proyecto. . .




QGIS 2.16.0-Nødebo
Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Help
Layers Panel
ne_10m_urban_areas
ne_10m_railroads
ne_10m_pop_places
ne_10m_admin1
ne_10m_countries
MERCATOR


QGIS 2.16.0-Nødebo
Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Help
Layers Panel
ne_10m_urban_areas
ne_10m_railroads
ne_10m_pop_places
ne_10m_admin1
ne_10m_countries
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Magnifier 100%
Rotation 0.0
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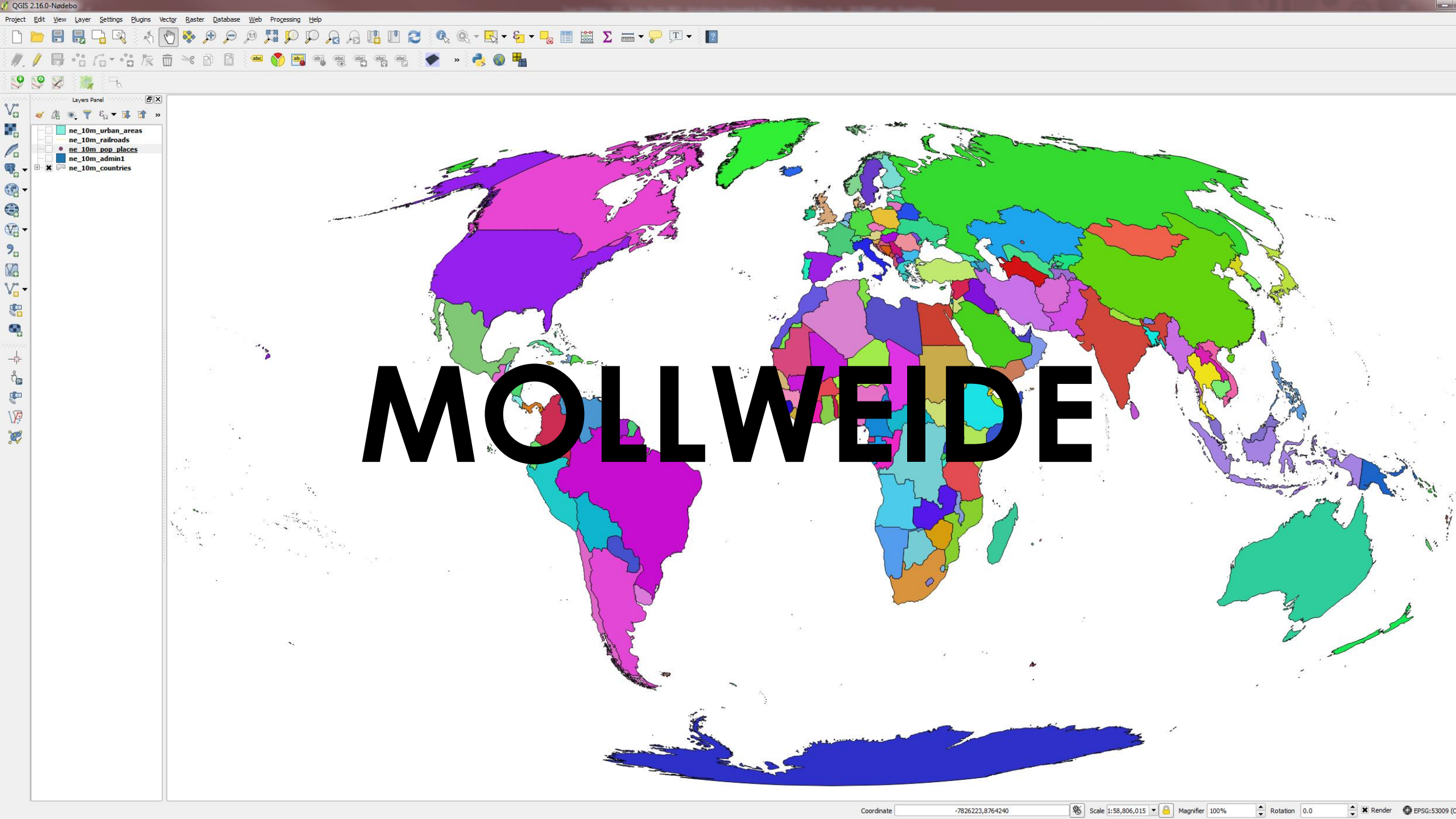
EPSG:53024


QGIS 2.16.0-Nødebo
Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Help
Layers Panel
ne_10m_urban_areas
ne_10m_railroads
ne_10m_pop_places
ne_10m_admin1
ne_10m_countries
MOLLWEIDE
Coordinate -7826223,8764240
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Rotation 0.0
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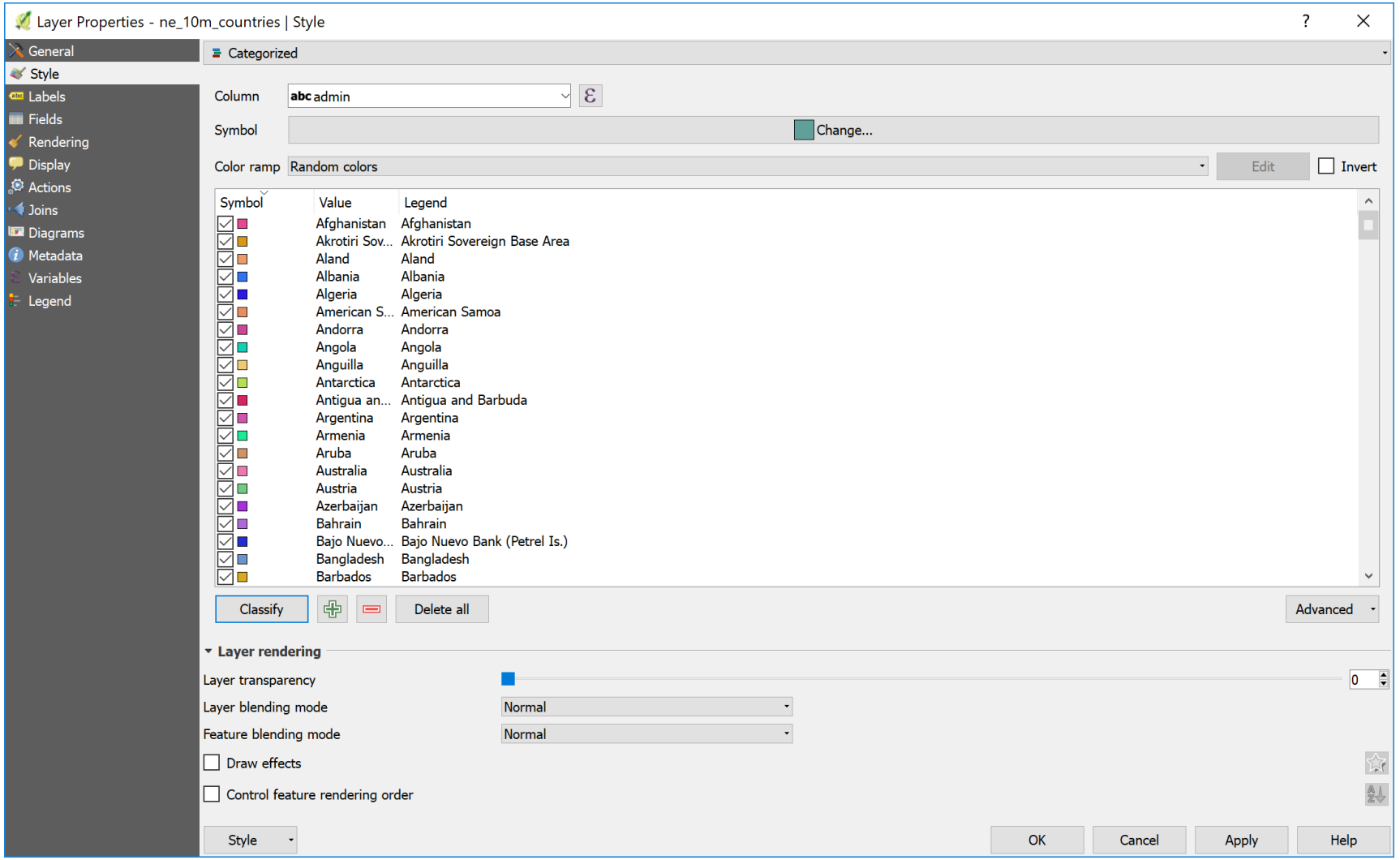
EPSG:53009

Change the Layer's Symbology . . .

Cambiar la simbología de la capa. . .



QGIS 2.18.12

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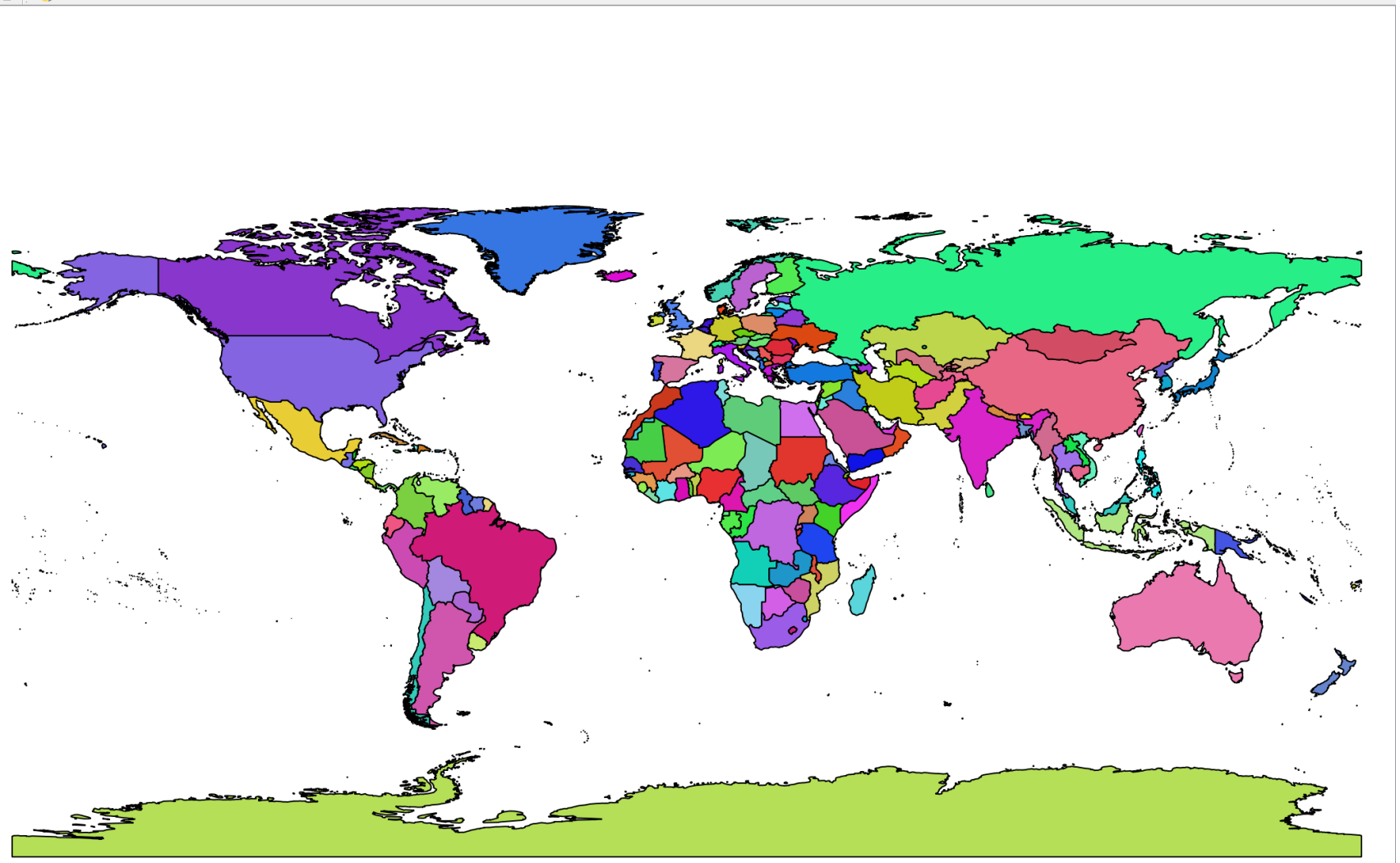
Browser Panel

- ENTRE_PARES_2017
  - Data
    - DEM_1km
    - INEGI_socio_demo
    - Natural_Earth
    - USGS_Topo_Maps
  - Notes
  - Presentation
  - Projects
- Documents
- Downloads
- Favorites
- Links
- Music
- OneDrive
- Pictures
- Saved Games
- Searches
- Videos
- Public
- sarao3

Layers Panel

- ne_10m_countries



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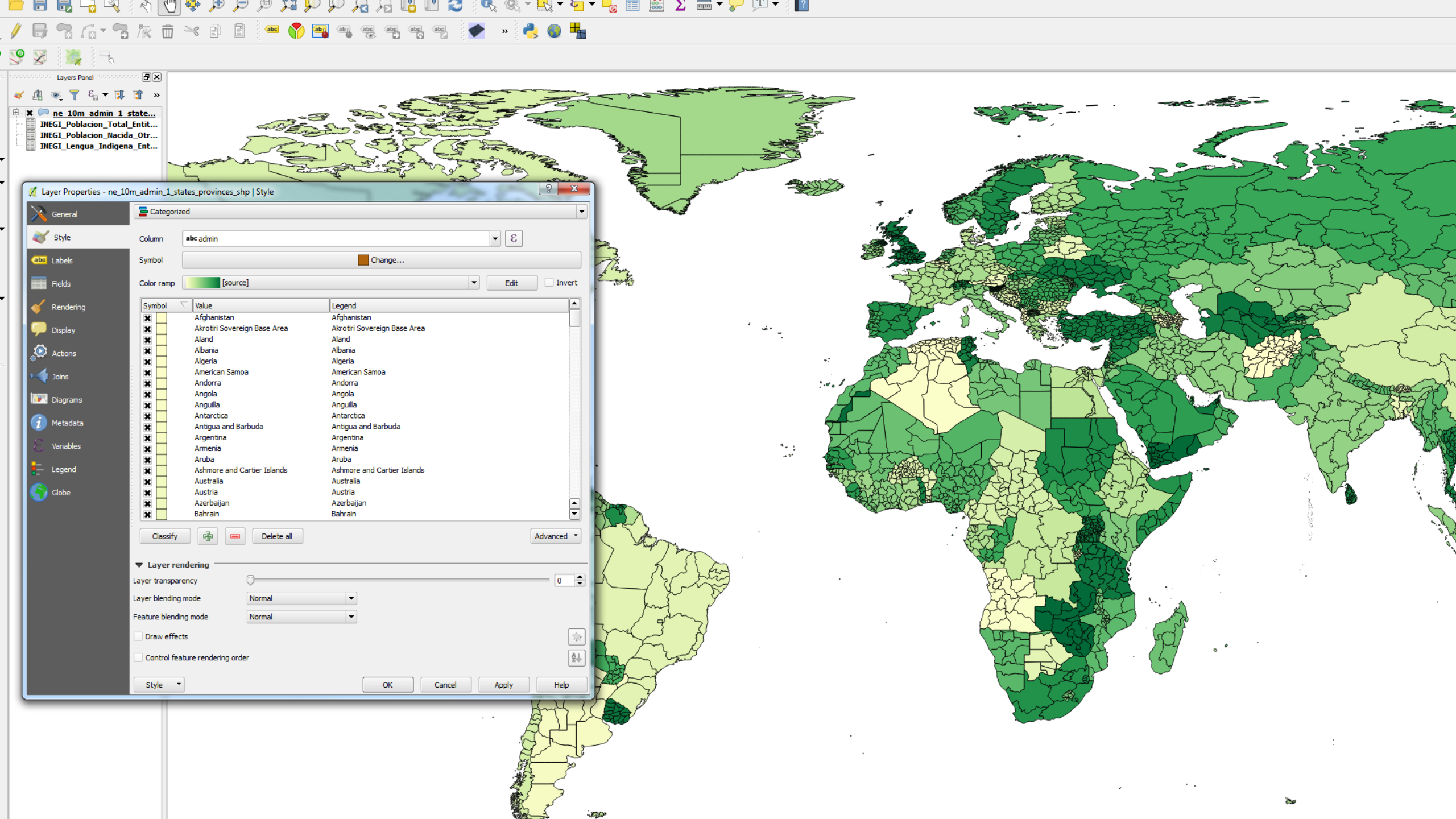
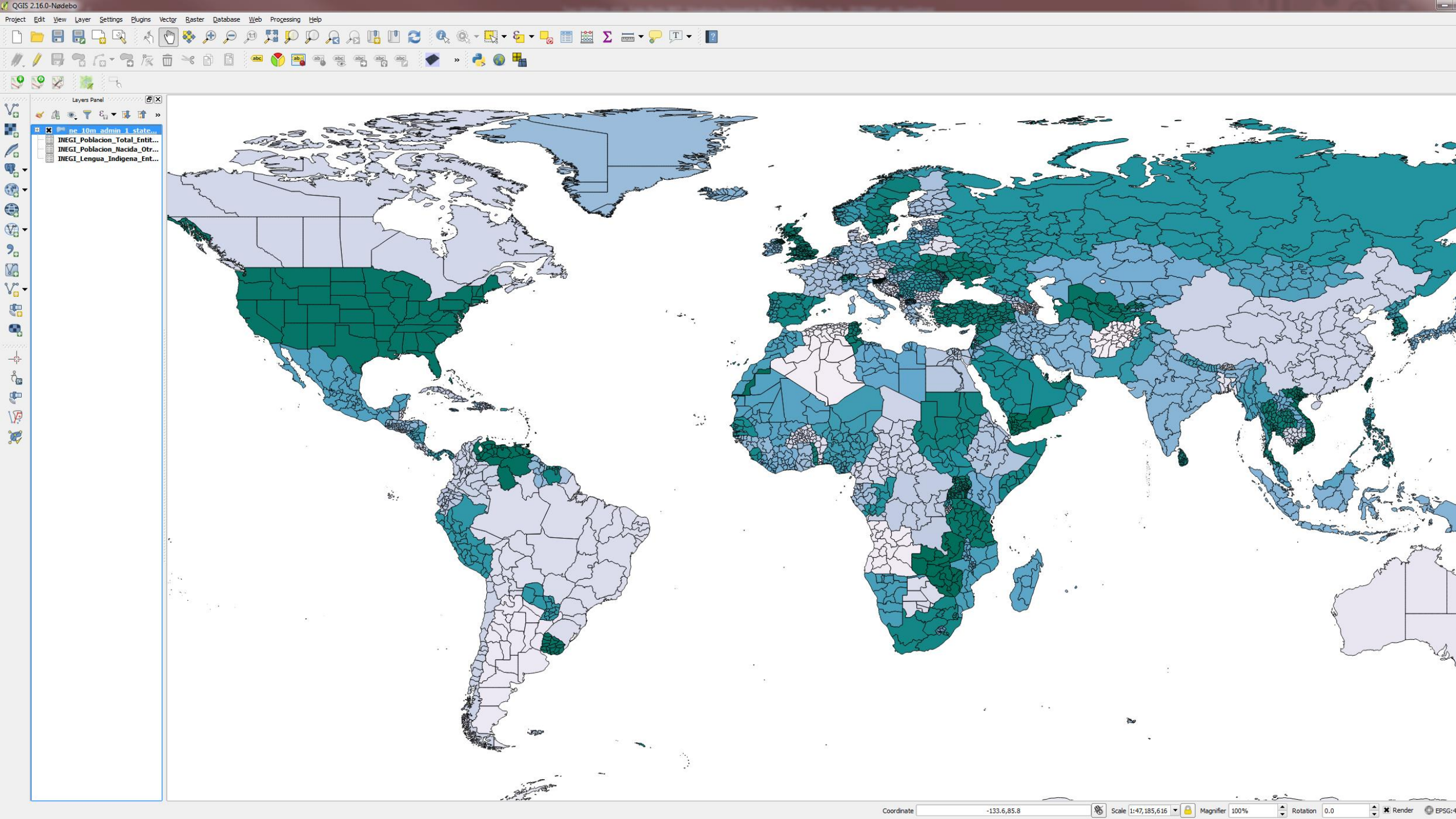

Layers Panel
ne_10m_admin_1_state...
INEGI_Poblacion_Total_Entit...
INEGI_Poblacion_Nacida_Otr...
INEGI_Lengua_Indigena_Ent...
Layer Properties - ne_10m_admin_1_states_provinces_shp | Style
General
Style
Labels
Fields
Rendering
Display
Actions
Joins
Diagrams
Metadata
Variables
Legend
Globe
Categorized
Column
abc admin
Symbol
Change...
Color ramp
[source]
Edit
Invert
Symbol
Value
Legend
Afghanistan
Akrotiri Sovereign Base Area
Aland
Albania
Algeria
American Samoa
Andorra
Angola
Anguilla
Antarctica
Antigua and Barbuda
Argentina
Armenia
Aruba
Ashmore and Cartier Islands
Australia
Austria
Azerbaijan
Bahrain
Classify
Delete all
Advanced
Layer rendering
Layer transparency
0
Layer blending mode
Normal
Feature blending mode
Normal
Draw effects
Control feature rendering order
Style
OK
Cancel
Apply
Help


QGIS 2.16.0-Nødebo
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Layers Panel
ne_10m_admin_1_state...
INEGI_Poblacion_Total_Entit...
INEGI_Poblacion_Nacida_Otr...
INEGI_Lengua_Indigena_Ent...
Coordinate -133.6,85.8
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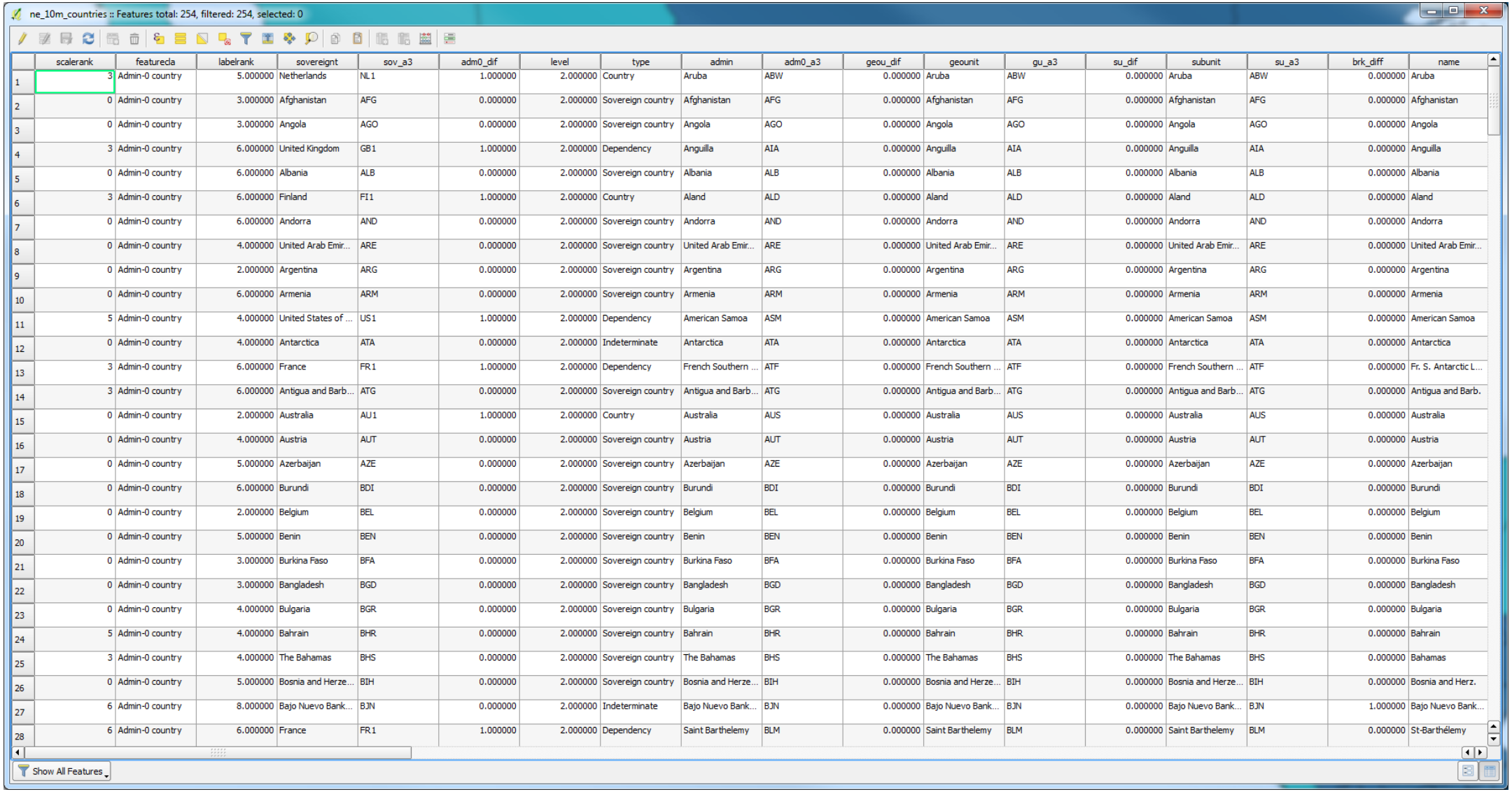
Render
EPSG:4

Explore the layer's attributes . . .

Explora los atributos de la capa. . .


ne_10m_countries :: Features total: 254, filtered: 254, selected: 0

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2	0	Admin-0 country	3.000000	Afghanistan	AFG	0.000000	2.000000	Sovereign country	Afghanistan	AFG	0.000000	Afghanistan	AFG	0.000000	Afghanistan	AFG	0.000000	Afghanistan
3	0	Admin-0 country	3.000000	Angola	AGO	0.000000	2.000000	Sovereign country	Angola	AGO	0.000000	Angola	AGO	0.000000	Angola	AGO	0.000000	Angola
4	3	Admin-0 country	6.000000	United Kingdom	GB1	1.000000	2.000000	Dependency	Anguilla	AIA	0.000000	Anguilla	AIA	0.000000	Anguilla	AIA	0.000000	Anguilla
5	0	Admin-0 country	6.000000	Albania	ALB	0.000000	2.000000	Sovereign country	Albania	ALB	0.000000	Albania	ALB	0.000000	Albania	ALB	0.000000	Albania
6	3	Admin-0 country	6.000000	Finland	FI1	1.000000	2.000000	Country	Aland	ALD	0.000000	Aland	ALD	0.000000	Aland	ALD	0.000000	Aland
7	0	Admin-0 country	6.000000	Andorra	AND	0.000000	2.000000	Sovereign country	Andorra	AND	0.000000	Andorra	AND	0.000000	Andorra	AND	0.000000	Andorra
8	0	Admin-0 country	4.000000	United Arab Emir...	ARE	0.000000	2.000000	Sovereign country	United Arab Emir...	ARE	0.000000	United Arab Emir...	ARE	0.000000	United Arab Emir...	ARE	0.000000	United Arab Emir...
9	0	Admin-0 country	2.000000	Argentina	ARG	0.000000	2.000000	Sovereign country	Argentina	ARG	0.000000	Argentina	ARG	0.000000	Argentina	ARG	0.000000	Argentina
10	0	Admin-0 country	6.000000	Armenia	ARM	0.000000	2.000000	Sovereign country	Armenia	ARM	0.000000	Armenia	ARM	0.000000	Armenia	ARM	0.000000	Armenia
11	5	Admin-0 country	4.000000	United States of ...	US1	1.000000	2.000000	Dependency	American Samoa	ASM	0.000000	American Samoa	ASM	0.000000	American Samoa	ASM	0.000000	American Samoa
12	0	Admin-0 country	4.000000	Antarctica	ATA	0.000000	2.000000	Indeterminate	Antarctica	ATA	0.000000	Antarctica	ATA	0.000000	Antarctica	ATA	0.000000	Antarctica
13	3	Admin-0 country	6.000000	France	FR1	1.000000	2.000000	Dependency	French Southern ...	ATF	0.000000	French Southern ...	ATF	0.000000	French Southern ...	ATF	0.000000	Fr. S. Antarctic L...
14	3	Admin-0 country	6.000000	Antigua and Barb...	ATG	0.000000	2.000000	Sovereign country	Antigua and Barb...	ATG	0.000000	Antigua and Barb...	ATG	0.000000	Antigua and Barb...	ATG	0.000000	Antigua and Barb.
15	0	Admin-0 country	2.000000	Australia	AU1	1.000000	2.000000	Country	Australia	AUS	0.000000	Australia	AUS	0.000000	Australia	AUS	0.000000	Australia
16	0	Admin-0 country	4.000000	Austria	AUT	0.000000	2.000000	Sovereign country	Austria	AUT	0.000000	Austria	AUT	0.000000	Austria	AUT	0.000000	Austria
17	0	Admin-0 country	5.000000	Azerbaijan	AZE	0.000000	2.000000	Sovereign country	Azerbaijan	AZE	0.000000	Azerbaijan	AZE	0.000000	Azerbaijan	AZE	0.000000	Azerbaijan
18	0	Admin-0 country	6.000000	Burundi	BDI	0.000000	2.000000	Sovereign country	Burundi	BDI	0.000000	Burundi	BDI	0.000000	Burundi	BDI	0.000000	Burundi
19	0	Admin-0 country	2.000000	Belgium	BEL	0.000000	2.000000	Sovereign country	Belgium	BEL	0.000000	Belgium	BEL	0.000000	Belgium	BEL	0.000000	Belgium
20	0	Admin-0 country	5.000000	Benin	BEN	0.000000	2.000000	Sovereign country	Benin	BEN	0.000000	Benin	BEN	0.000000	Benin	BEN	0.000000	Benin
21	0	Admin-0 country	3.000000	Burkina Faso	BFA	0.000000	2.000000	Sovereign country	Burkina Faso	BFA	0.000000	Burkina Faso	BFA	0.000000	Burkina Faso	BFA	0.000000	Burkina Faso
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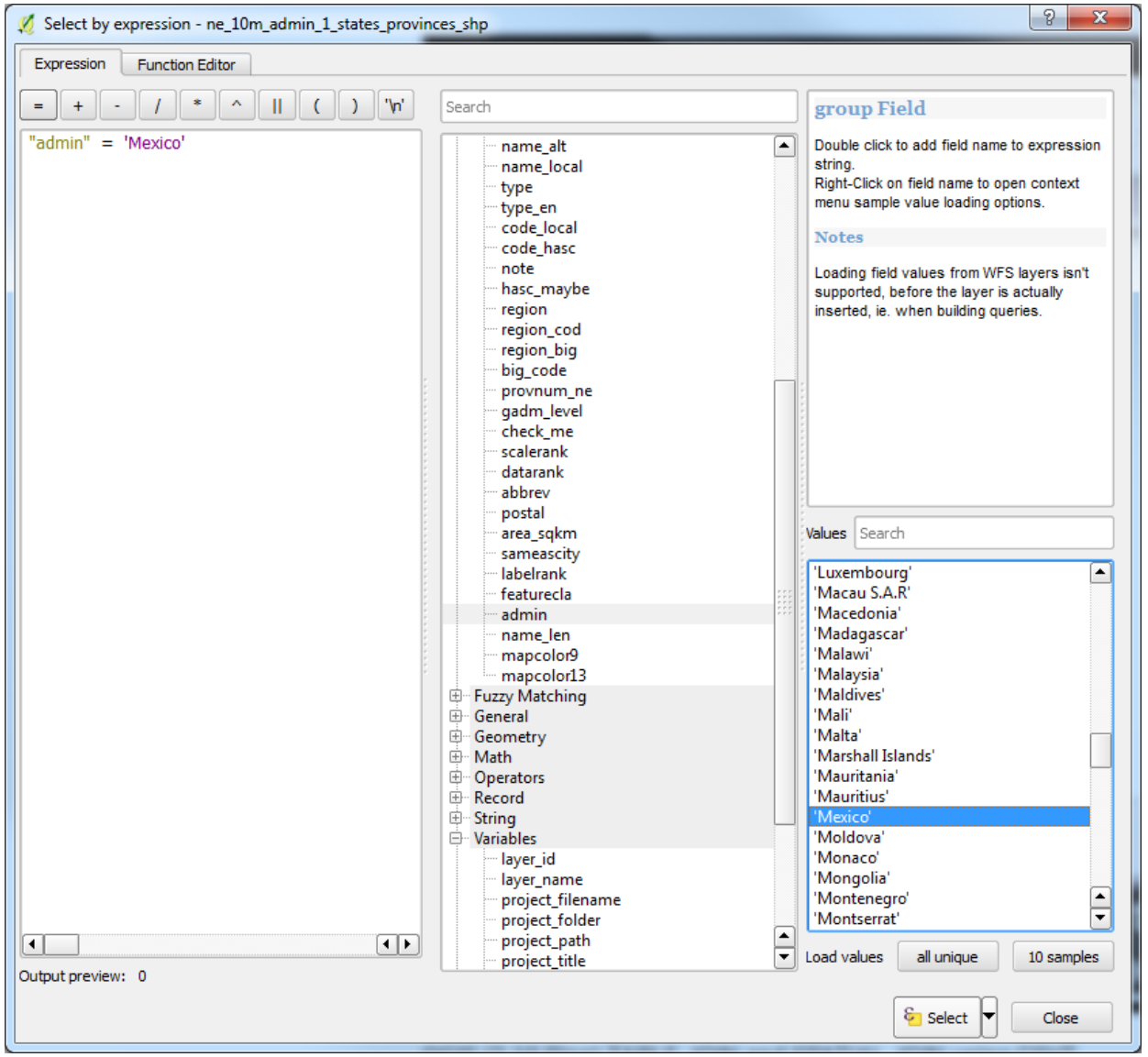
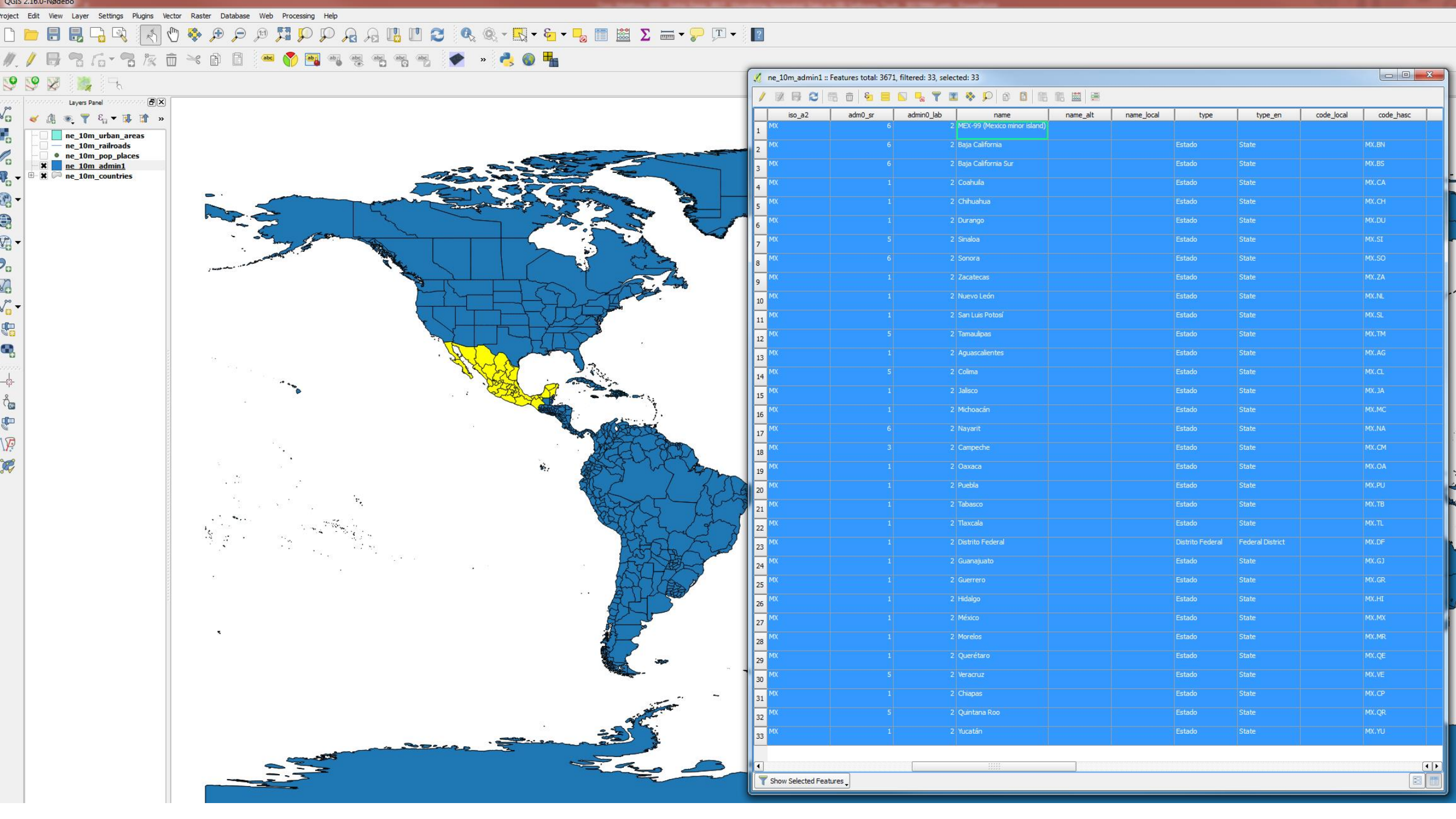
23	0	Admin-0 country	4.000000	Bulgaria	BGR	0.000000	2.000000	Sovereign country	Bulgaria	BGR	0.000000	Bulgaria	BGR	0.000000	Bulgaria	BGR	0.000000	Bulgaria
24	5	Admin-0 country	4.000000	Bahrain	BHR	0.000000	2.000000	Sovereign country	Bahrain	BHR	0.000000	Bahrain	BHR	0.000000	Bahrain	BHR	0.000000	Bahrain
25	3	Admin-0 country	4.000000	The Bahamas	BHS	0.000000	2.000000	Sovereign country	The Bahamas	BHS	0.000000	The Bahamas	BHS	0.000000	The Bahamas	BHS	0.000000	Bahamas
26	0	Admin-0 country	5.000000	Bosnia and Herze...	BIH	0.000000	2.000000	Sovereign country	Bosnia and Herze...	BIH	0.000000	Bosnia and Herze...	BIH	0.000000	Bosnia and Herze...	BIH	0.000000	Bosnia and Herz.
27	6	Admin-0 country	8.000000	Bajo Nuevo Bank...	BJN	0.000000	2.000000	Indeterminate	Bajo Nuevo Bank...	BJN	0.000000	Bajo Nuevo Bank...	BJN	0.000000	Bajo Nuevo Bank...	BJN	1.000000	Bajo Nuevo Bank...
28	6	Admin-0 country	6.000000	France	FR1	1.000000	2.000000	Dependency	Saint Barthelemy	BLM	0.000000	Saint Barthelemy	BLM	0.000000	Saint Barthelemy	BLM	0.000000	St-Barthélemy

Show All Features

Select features by attributes . . .

Seleccione entidades por atributos. . .





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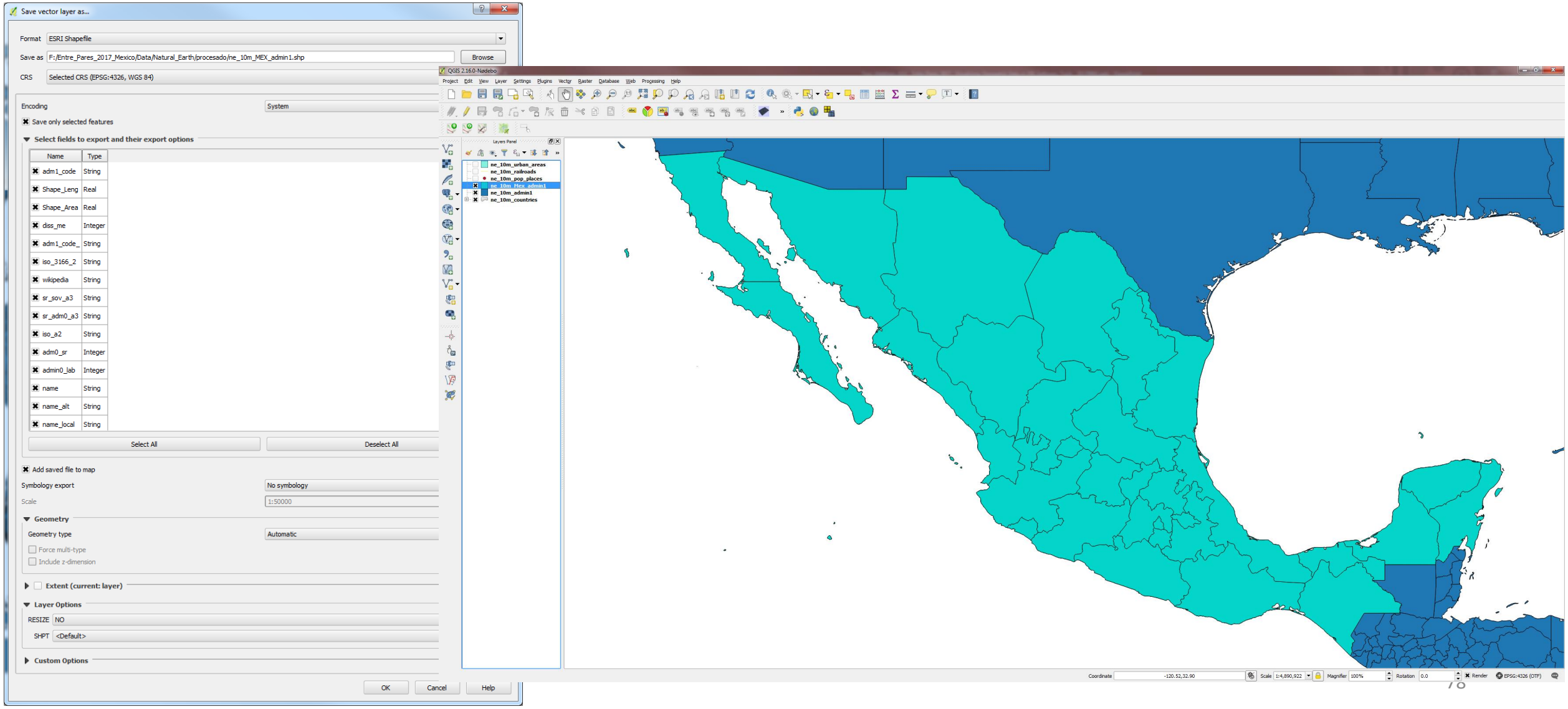
2	MX	6	2	Baja California			Estado	State		MX.BN
3	MX	6	2	Baja California Sur			Estado	State		MX.BS
4	MX	1	2	Coahuila			Estado	State		MX.CA
5	MX	1	2	Chihuahua			Estado	State		MX.CH
6	MX	1	2	Durango			Estado	State		MX.DU
7	MX	5	2	Sinaloa			Estado	State		MX.SI
8	MX	6	2	Sonora			Estado	State		MX.SO
9	MX	1	2	Zacatecas			Estado	State		MX.ZA
10	MX	1	2	Nuevo León			Estado	State		MX.NL
11	MX	1	2	San Luis Potosí			Estado	State		MX.SL
12	MX	5	2	Tamaulipas			Estado	State		MX.TM
13	MX	1	2	Aguascalientes			Estado	State		MX.AG
14	MX	5	2	Colima			Estado	State		MX.CL
15	MX	1	2	Jalisco			Estado	State		MX.JA
16	MX	1	2	Michoacán			Estado	State		MX.MC
17	MX	6	2	Nayarit			Estado	State		MX.NA
18	MX	3	2	Campeche			Estado	State		MX.CM
19	MX	1	2	Oaxaca			Estado	State		MX.OA
20	MX	1	2	Puebla			Estado	State		MX.PU
21	MX	1	2	Tabasco			Estado	State		MX.TB
22	MX	1	2	Tlaxcala			Estado	State		MX.TL
23	MX	1	2	Distrito Federal			Distrito Federal	Federal District		MX.DF
24	MX	1	2	Guanajuato			Estado	State		MX.GJ
25	MX	1	2	Guerrero			Estado	State		MX.GR
26	MX	1	2	Hidalgo			Estado	State		MX.HI
27	MX	1	2	México			Estado	State		MX.MX
28	MX	1	2	Morelos			Estado	State		MX.MR
29	MX	1	2	Querétaro			Estado	State		MX.QE
30	MX	5	2	Veracruz			Estado	State		MX.VE
31	MX	1	2	Chiapas			Estado	State		MX.CP
32	MX	5	2	Quintana Roo			Estado	State		MX.QR
33	MX	1	2	Yucatán			Estado	State		MX.YU

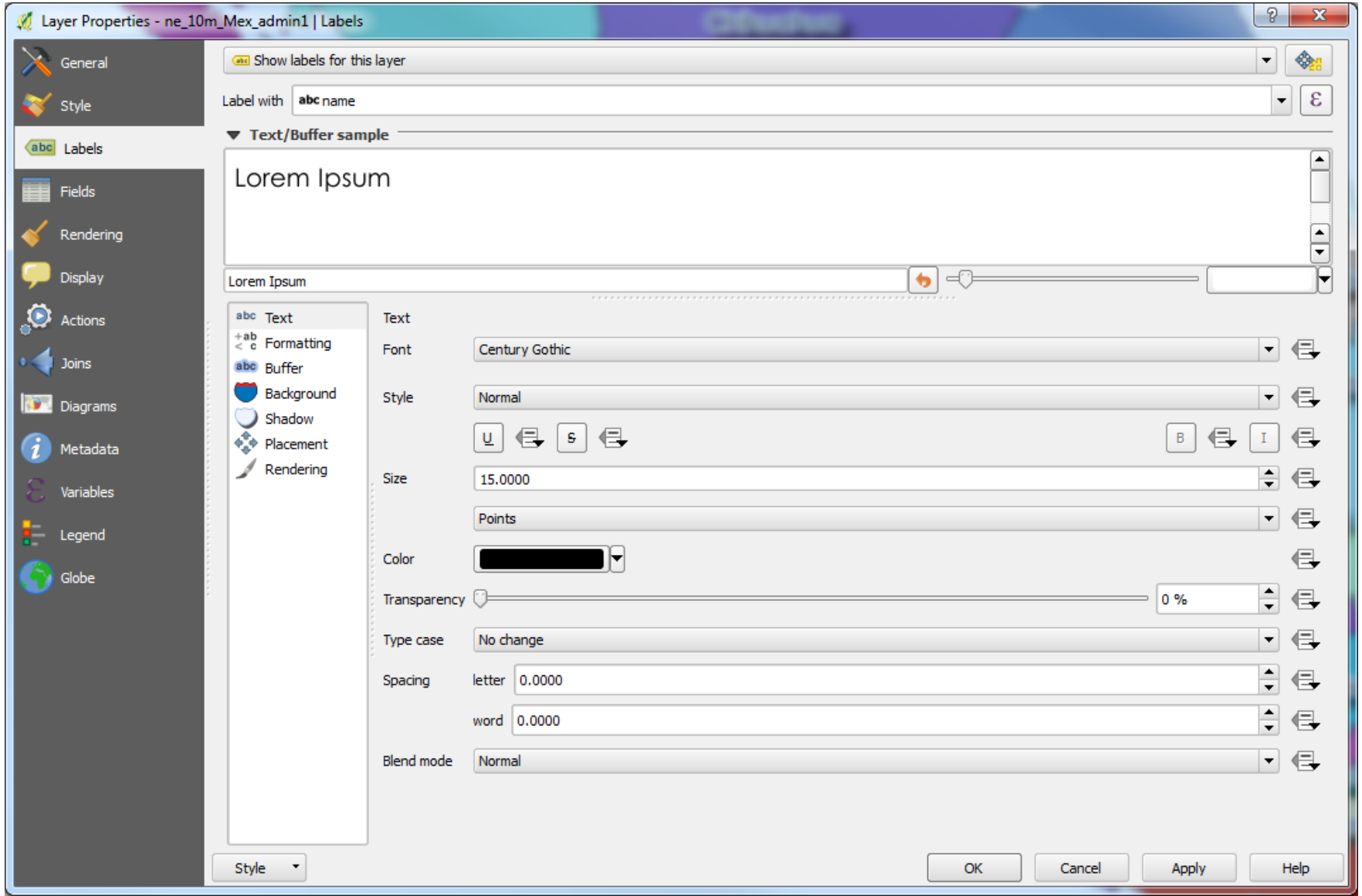
Extract subsets by attributes . . .

Extraiga Subconjuntos por Atributos . . .



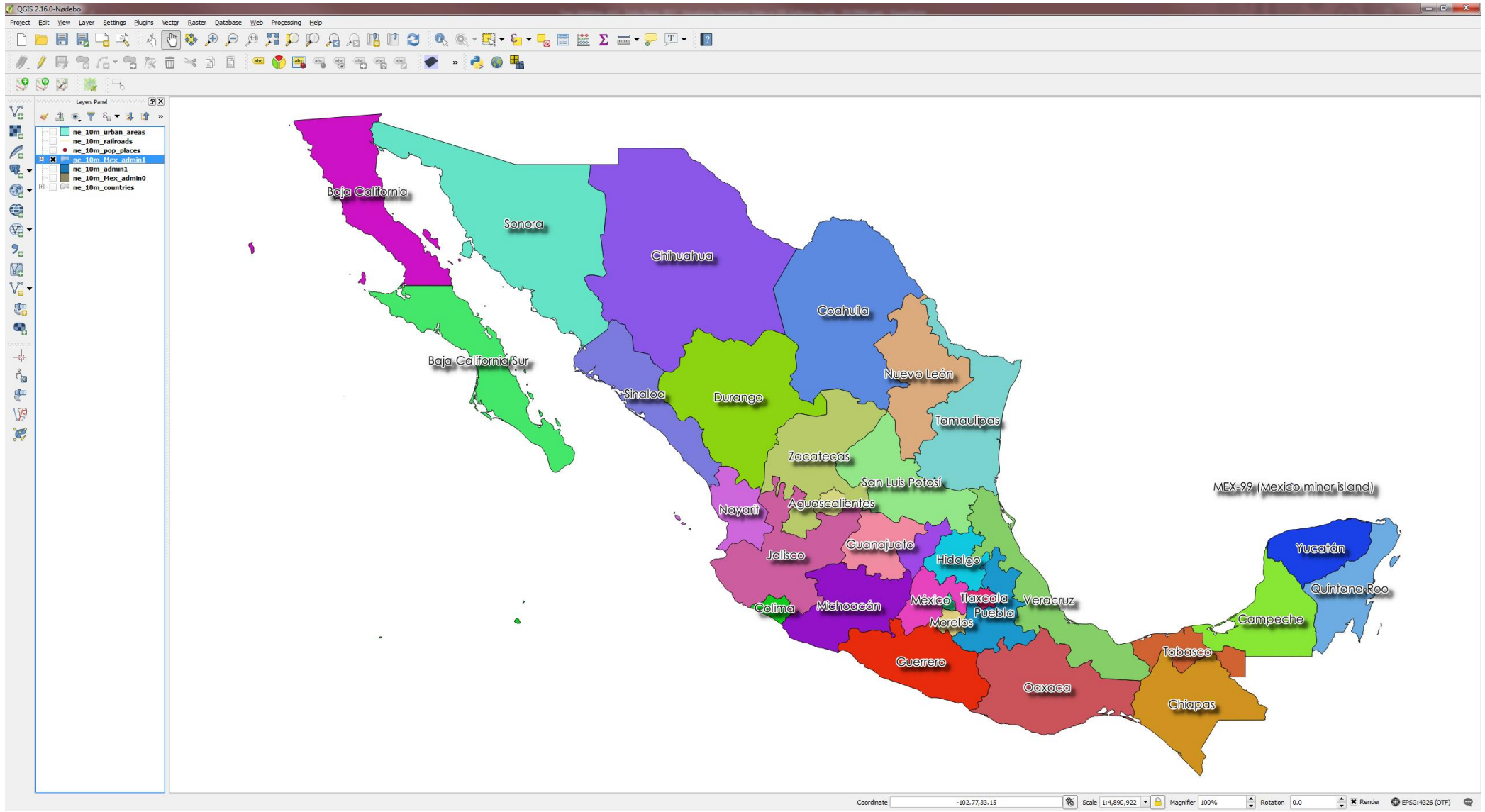
Add Labels . . .

Agregar etiquetas . . .



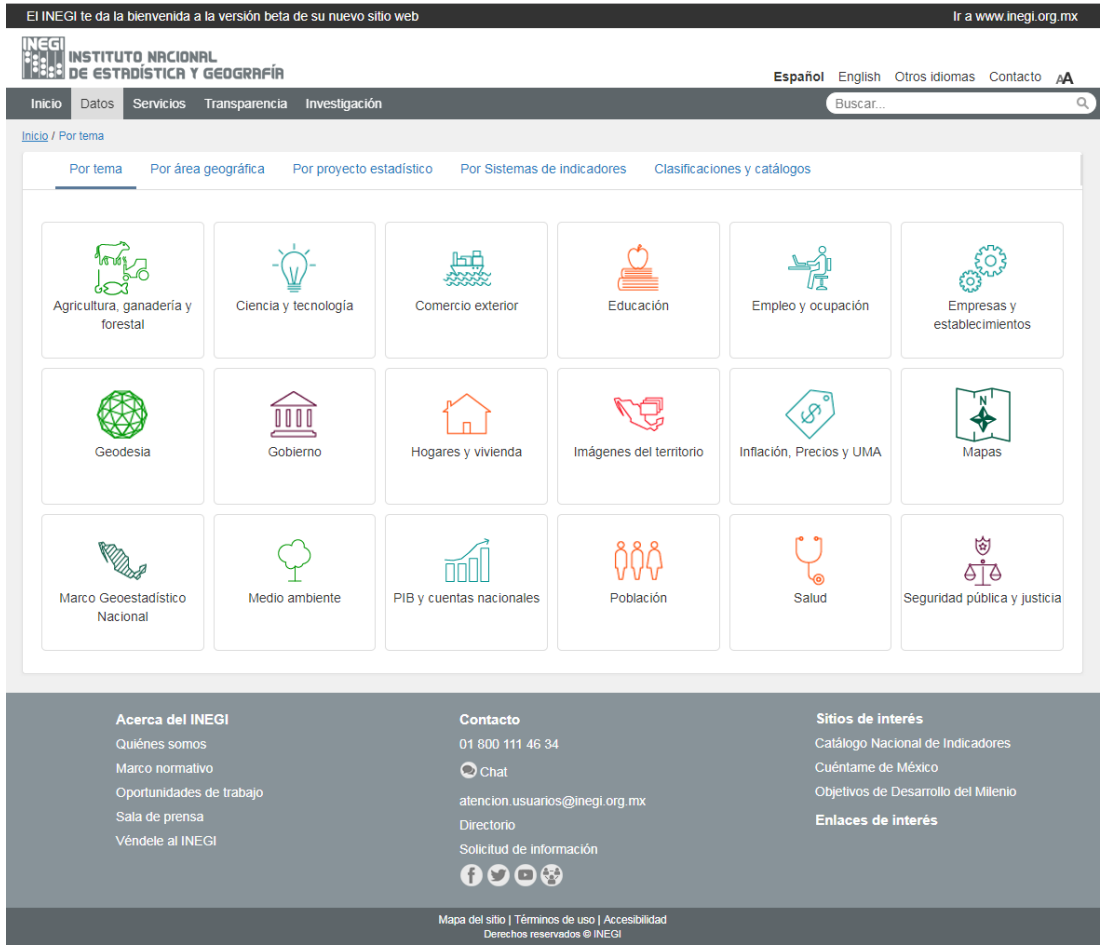
Add Labels . . .

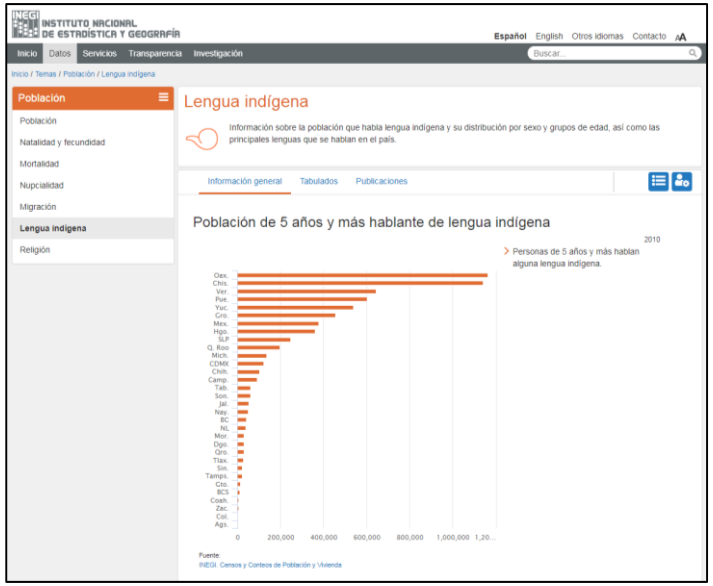
Agregar etiquetas . . .

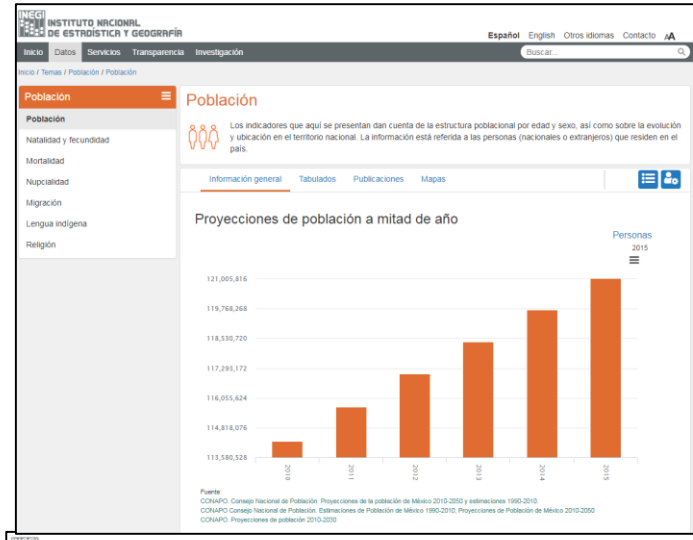


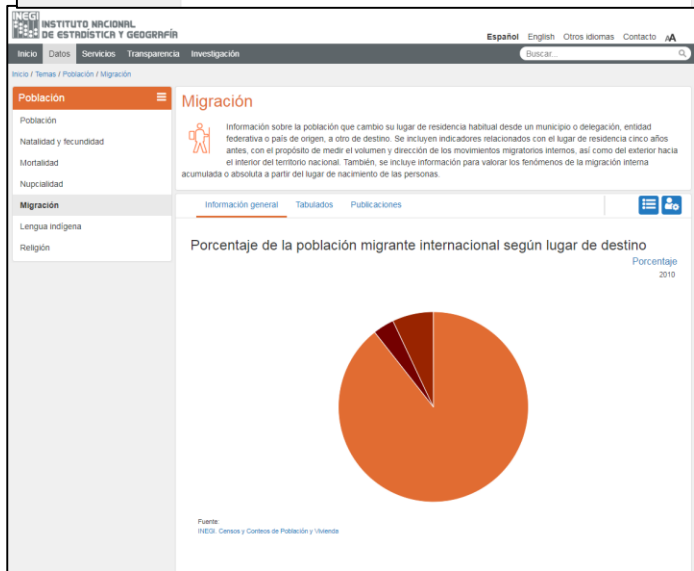
Gather additional data . . .

Recopilar datos adicionales. . .









http://www.beta.inegi.org.mx/datos/

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1 Selecciona el tabulado — 2 Selecciona las variables — 3 Ver el tabulado

Población de 5 años y más hablante de lengua indígena por entidad federativa según sexo, 1990 a 2010

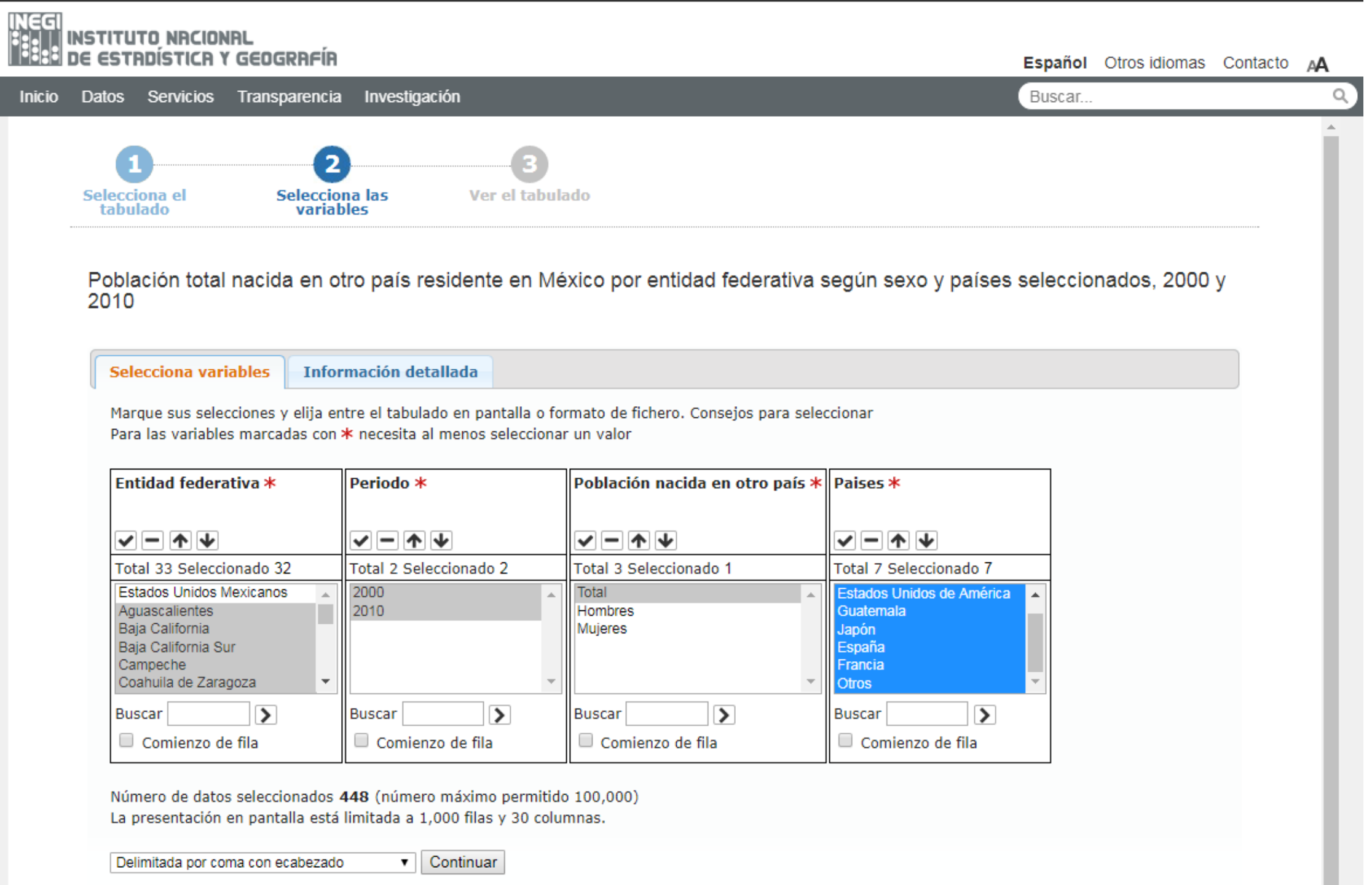
Selecciona variables | Información detallada

Marque sus selecciones y elija entre el tabulado en pantalla o formato de fichero. Consejos para seleccionar
Para las variables marcadas con * necesita al menos seleccionar un valor

Entidad federativa *	año *	sexo *
Total 33 Seleccionado 32	Total 5 Seleccionado 5	Total 3 Seleccionado 3
Estados Unidos Mexicanos Aguascalientes Baja California Baja California Sur Campeche Coahuila de Zaragoza	1990 1995 2000 2005 2010	Total Hombres Mujeres
Buscar Comienzo de fila	Buscar Comienzo de fila	Buscar Comienzo de fila

Número de datos seleccionados **480** (número máximo permitido 100,000)
La presentación en pantalla está limitada a 1,000 filas y 30 columnas.

Delimitada por coma con ecabezado ▼ Continuar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2 Selecciona las variables
3 Ver el tabulado
Población total nacida en otro país residente en México por entidad federativa según sexo y países seleccionados, 2000 y 2010
Selecciona variables
Información detallada
Marque sus selecciones y elija entre el tabulado en pantalla o formato de fichero. Consejos para seleccionar
Para las variables marcadas con * necesita al menos seleccionar un valor
Entidad federativa *
Total 33 Seleccionado 32
Estados Unidos Mexicanos
Aguascalientes
Baja California
Baja California Sur
Campeche
Coahuila de Zaragoza
Buscar
Comienzo de fila
Periodo *
Total 2 Seleccionado 2
2000
2010
Buscar
Comienzo de fila
Población nacida en otro país *
Total 3 Seleccionado 1
Total
Hombres
Mujeres
Buscar
Comienzo de fila
Paises *
Total 7 Seleccionado 7
Estados Unidos de América
Guatemala
Japón
España
Francia
Otros
Buscar
Comienzo de fila
Número de datos seleccionados 448 (número máximo permitido 100,000)
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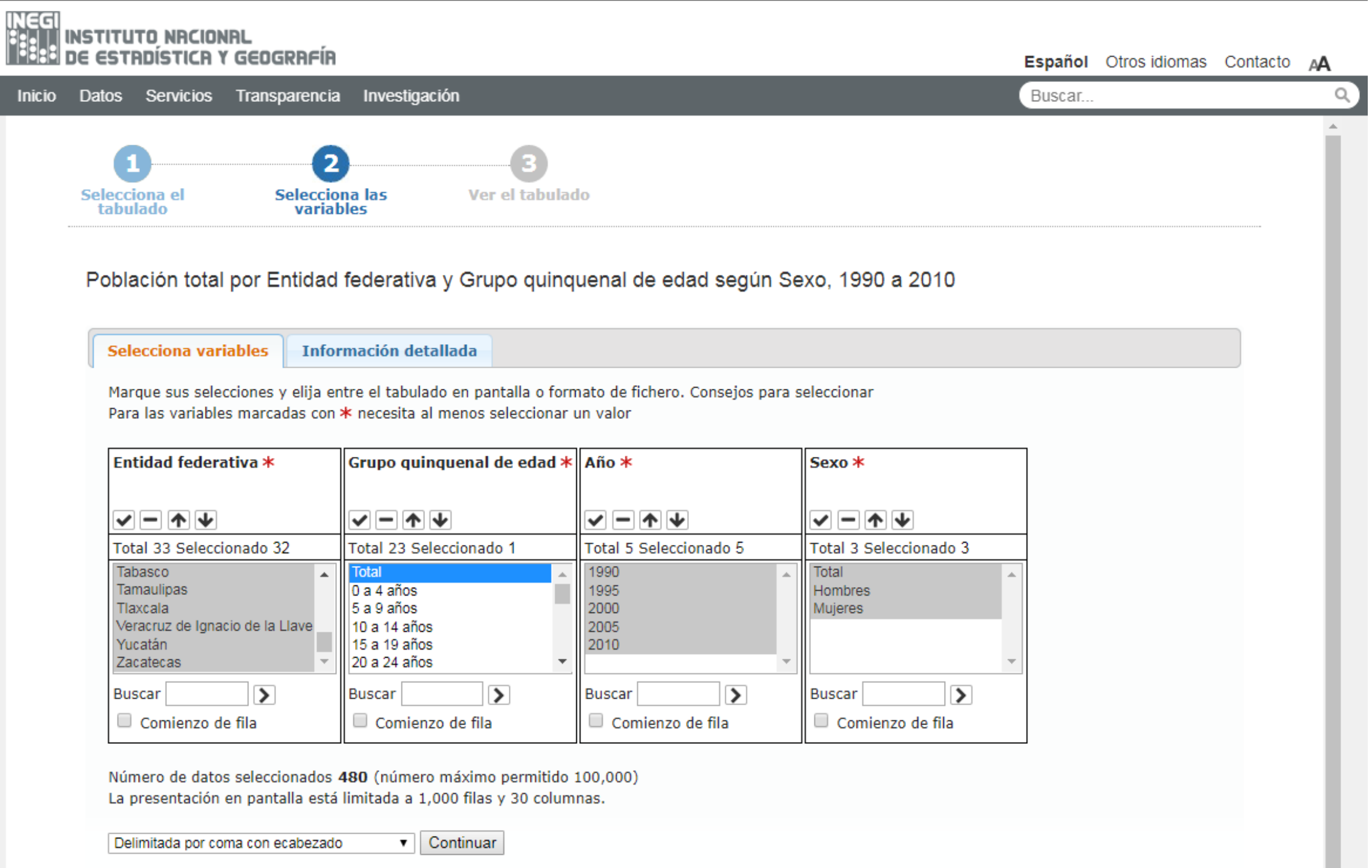
Delimitada por coma con ecabezado
Continuar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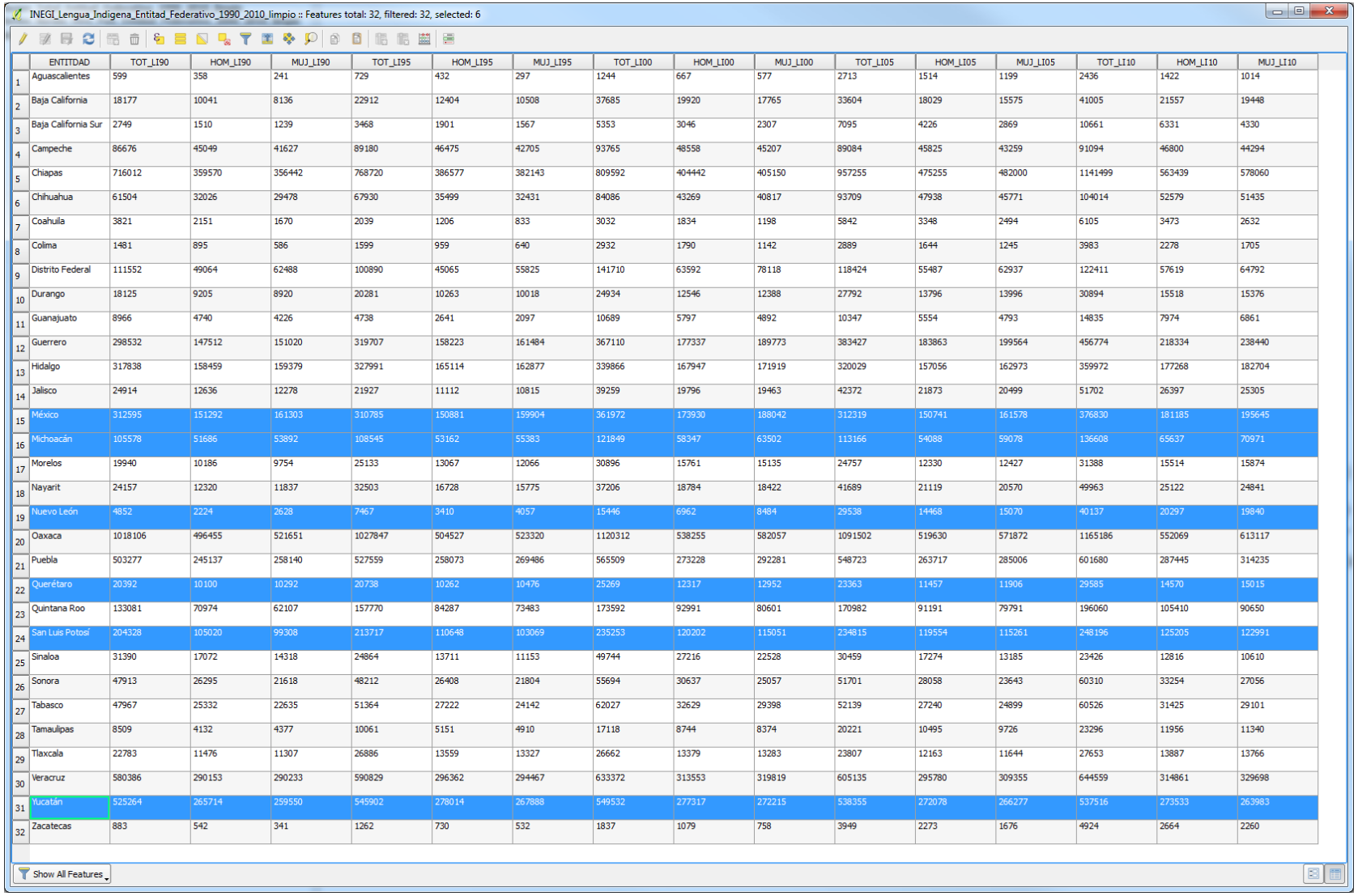
Inicio Datos Servicios Transparencia Investigación
Buscar...
1 Selecciona el tabulado
2 Selecciona las variables
3 Ver el tabulado
Población total por Entidad federativa y Grupo quinquenal de edad según Sexo, 1990 a 2010
Selecciona variables
Información detallada
Marque sus selecciones y elija entre el tabulado en pantalla o formato de fichero. Consejos para seleccionar
Para las variables marcadas con * necesita al menos seleccionar un valor
Entidad federativa *
Total 33 Seleccionado 32
Tabasco
Tamaulipas
Tlaxcala
Veracruz de Ignacio de la Llave
Yucatán
Zacatecas
Buscar
Comienzo de fila
Grupo quinquenal de edad *
Total 23 Seleccionado 1
Total
0 a 4 años
5 a 9 años
10 a 14 años
15 a 19 años
20 a 24 años
Buscar
Comienzo de fila
Año *
Total 5 Seleccionado 5
1990
1995
2000
2005
2010
Buscar
Comienzo de fila
Sexo *
Total 3 Seleccionado 3
Total
Hombres
Mujeres
Buscar
Comienzo de fila
Número de datos seleccionados 480 (número máximo permitido 100,000)
La presentación en pantalla está limitada a 1,000 filas y 30 columnas.
Delimitada por coma con ecabezado
Continuar

Clean Tabular Data . . .

Limpie los datos tabulares. . .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1	Aguascalientes	599	358	241	729	432	297	1244	667	577	2713	1514	1199	2436	1422	1014
2	Baja California	18177	10041	8136	22912	12404	10508	37685	19920	17765	33604	18029	15575	41005	21557	19448
3	Baja California Sur	2749	1510	1239	3468	1901	1567	5353	3046	2307	7095	4226	2869	10661	6331	4330
4	Campeche	86676	45049	41627	89180	46475	42705	93765	48558	45207	89084	45825	43259	91094	46800	44294
5	Chiapas	716012	359570	356442	768720	386577	382143	809592	404442	405150	957255	475255	482000	1141499	563439	578060
6	Chihuahua	61504	32026	29478	67930	35499	32431	84086	43269	40817	93709	47938	45771	104014	52579	51435
7	Coahuila	3821	2151	1670	2039	1206	833	3032	1834	1198	5842	3348	2494	6105	3473	2632
8	Colima	1481	895	586	1599	959	640	2932	1790	1142	2889	1644	1245	3983	2278	1705
9	Distrito Federal	111552	49064	62488	100890	45065	55825	141710	63592	78118	118424	55487	62937	122411	57619	64792
10	Durango	18125	9205	8920	20281	10263	10018	24934	12546	12388	27792	13796	13996	30894	15518	15376
11	Guanajuato	8966	4740	4226	4738	2641	2097	10689	5797	4892	10347	5554	4793	14835	7974	6861
12	Guerrero	298532	147512	151020	319707	158223	161484	367110	177337	189773	383427	183863	199564	456774	218334	238440
13	Hidalgo	317838	158459	159379	327991	165114	162877	339866	167947	171919	320029	157056	162973	359972	177268	182704
14	Jalisco	24914	12636	12278	21927	11112	10815	39259	19796	19463	42372	21873	20499	51702	26397	25305
15	México	312595	151292	161303	310785	150881	159904	361972	173930	188042	312319	150741	161578	376830	181185	195645
16	Michoacán	105578	51686	53892	108545	53162	55383	121849	58347	63502	113166	54088	59078	136608	65637	70971
17	Morelos	19940	10186	9754	25133	13067	12066	30896	15761	15135	24757	12330	12427	31388	15514	15874
18	Nayarit	24157	12320	11837	32503	16728	15775	37206	18784	18422	41689	21119	20570	49963	25122	24841
19	Nuevo León	4852	2224	2628	7467	3410	4057	15446	6962	8484	29538	14468	15070	40137	20297	19840
20	Oaxaca	1018106	496455	521651	1027847	504527	523320	1120312	538255	582057	1091502	519630	571872	1165186	552069	613117
21	Puebla	503277	245137	258140	527559	258073	269486	565509	273228	292281	548723	263717	285006	601680	287445	314235
22	Querétaro	20392	10100	10292	20738	10262	10476	25269	12317	12952	23363	11457	11906	29585	14570	15015
23	Quintana Roo	133081	70974	62107	157770	84287	73483	173592	92991	80601	170982	91191	79791	196060	105410	90650
24	San Luis Potosí	204328	105020	99308	213717	110648	103069	235253	120202	115051	234815	119554	115261	248196	125205	122991
25	Sinaloa	31390	17072	14318	24864	13711	11153	49744	27216	22528	30459	17274	13185	23426	12816	10610
26	Sonora	47913	26295	21618	48212	26408	21804	55694	30637	25057	51701	28058	23643	60310	33254	27056
27	Tabasco	47967	25332	22635	51364	27222	24142	62027	32629	29398	52139	27240	24899	60526	31425	29101
28	Tamaulipas	8509	4132	4377	10061	5151	4910	17118	8744	8374	20221	10495	9726	23296	11956	11340
29	Tlaxcala	22783	11476	11307	26886	13559	13327	26662	13379	13283	23807	12163	11644	27653	13887	13766
30	Veracruz	580386	290153	290233	590829	296362	294467	633372	313553	319819	605135	295780	309355	644559	314861	329698
31	Yucatán	525264	265714	259550	545902	278014	267888	549532	277317	272215	538355	272078	266277	537516	273533	263983
32	Zacatecas	883	542	341	1262	730	532	1837	1079	758	3949	2273	1676	4924	2664	2260

Show All Features

Clean Tabular Data . . .

Limpie los datos tabulares. . .

INEGI_Lengua_Indigena_Entitad_Federativo_1990_2010_limpio :: Features total: 32, filtered: 6, selected: 6

	ENTITDAD	TOT_LI90	HOM_LI90	MUJ_LI90	TOT_LI95	HOM_LI95	MUJ_LI95	TOT_LI00	HOM_LI00	M
1	México	312595	151292	161303	310785	150881	159904	361972	173930	18804
2	Michoacán	105578	51686	53892	108545	53162	55383	121849	58347	63502
3	Nuevo León	4852	2224	2628	7467	3410	4057	15446	6962	8484
4	Querétaro	20392	10100	10292	20738	10262	10476	25269	12317	12952
5	San Luis Potosí	204328	105020	99308	213717	110648	103069	235253	120202	11505
6	Yucatán	525264	265714	259550	545902	278014	267888	549532	277317	27221

Show Selected Features

ne_10m_Mex_a...

	name
1	MEX-99 (Mexico minor island)
2	México
3	Michoacán
4	Nuevo León
5	Querétaro
6	San Luis Potosí
7	Yucatán

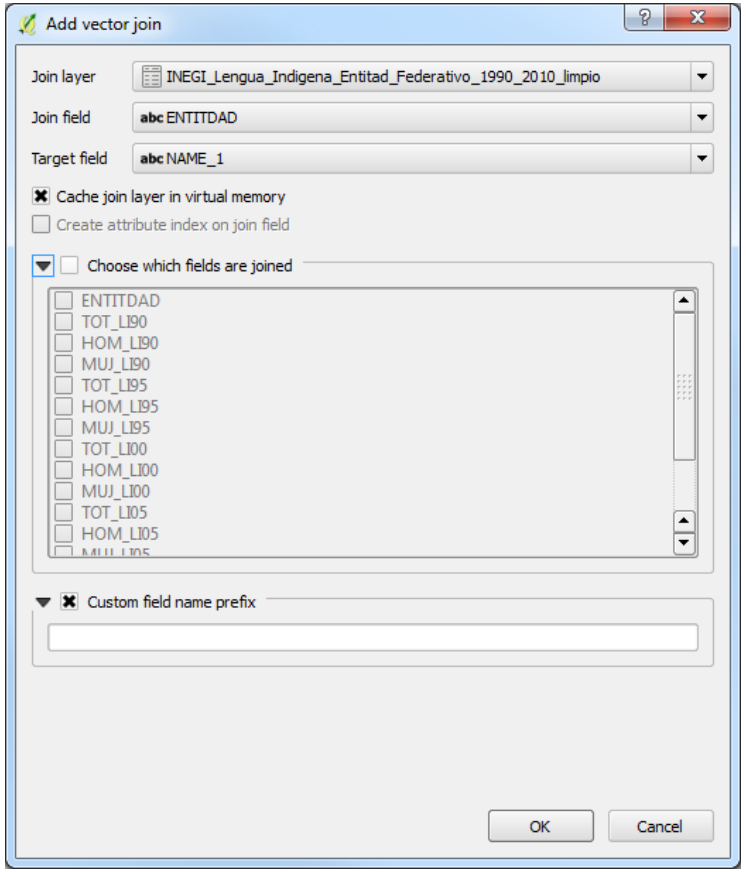
Show Selected Features

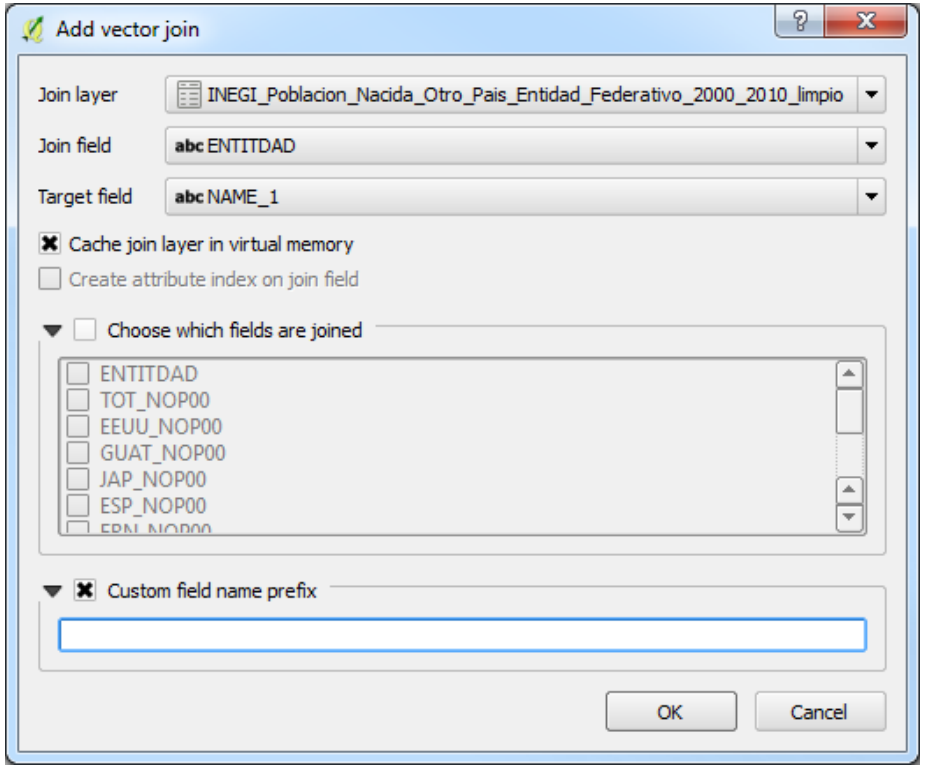
We need our data to match

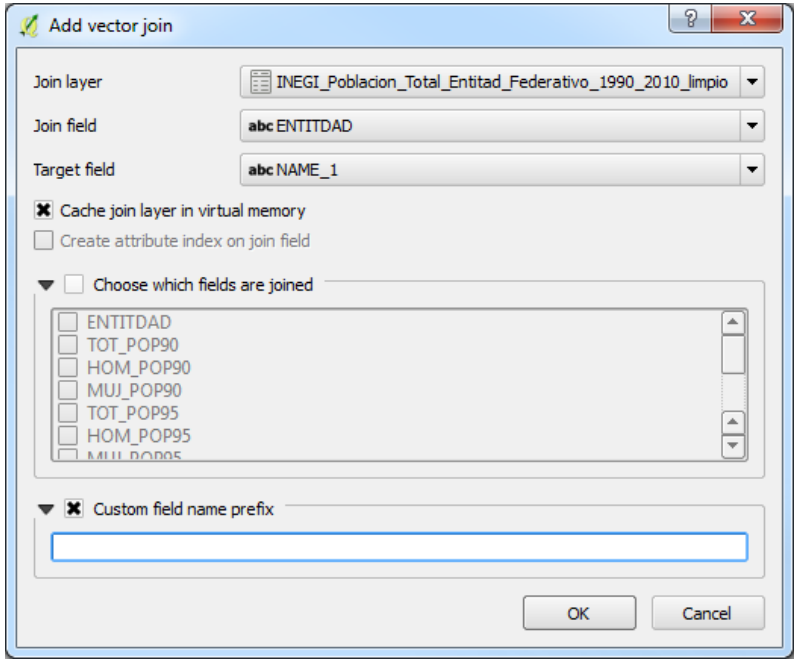
Necesitamos que nuestros datos coincidan

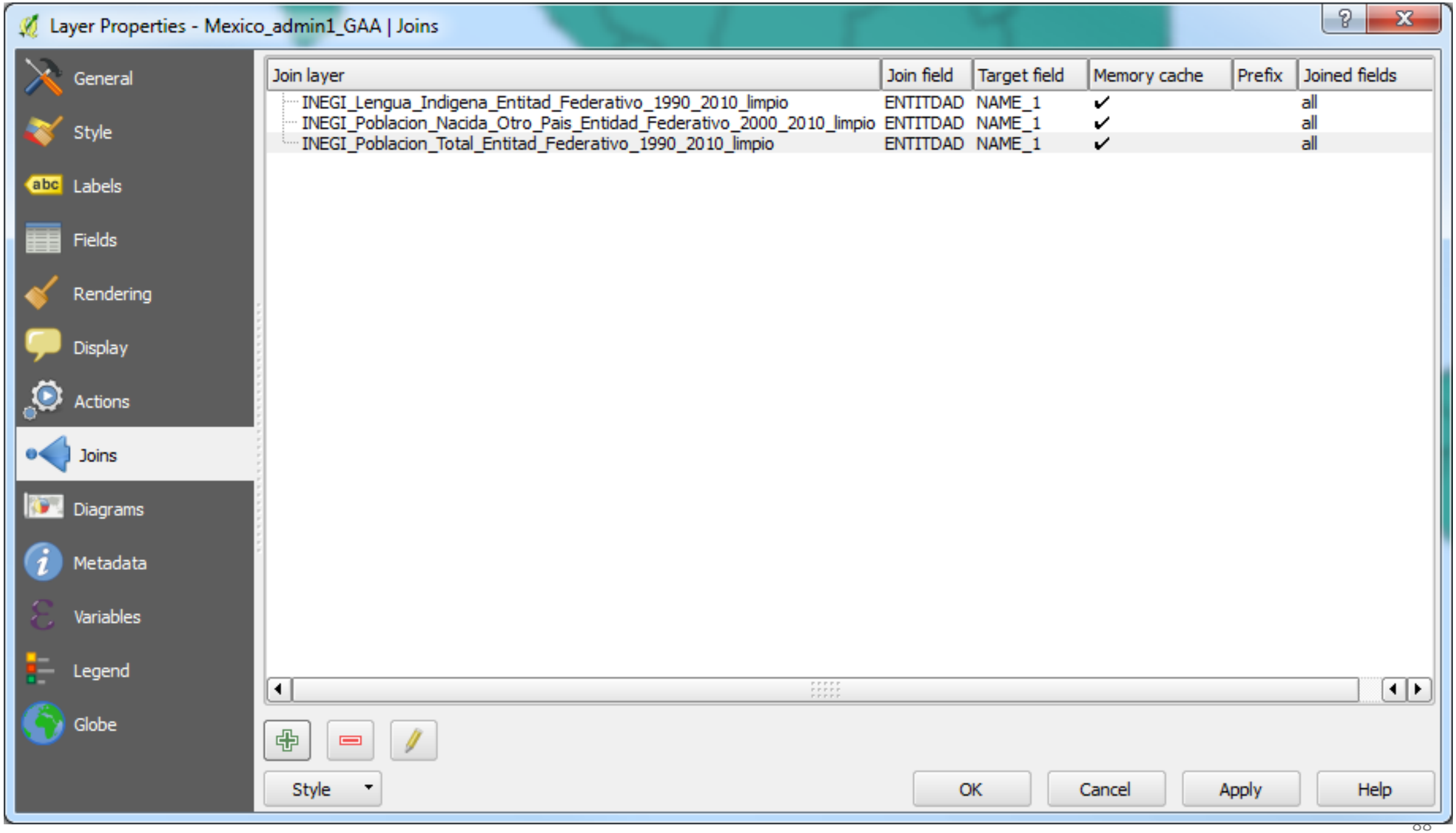
Join Tabular Data to Vector Data . . .

Unir Datos Tabulares a Datos Vectoriales





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General
Style
Labels
Fields
Rendering
Display
Actions
Joins
Diagrams
Metadata
Variables
Legend
Globe
Join layer
Join field
Target field
Memory cache
Prefix
Joined fields
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INEGI_Poblacion_Nacida_Otro_Pais_Entidad_Federativo_2000_2010_limpio ENTITDAD NAME_1 ✔ all
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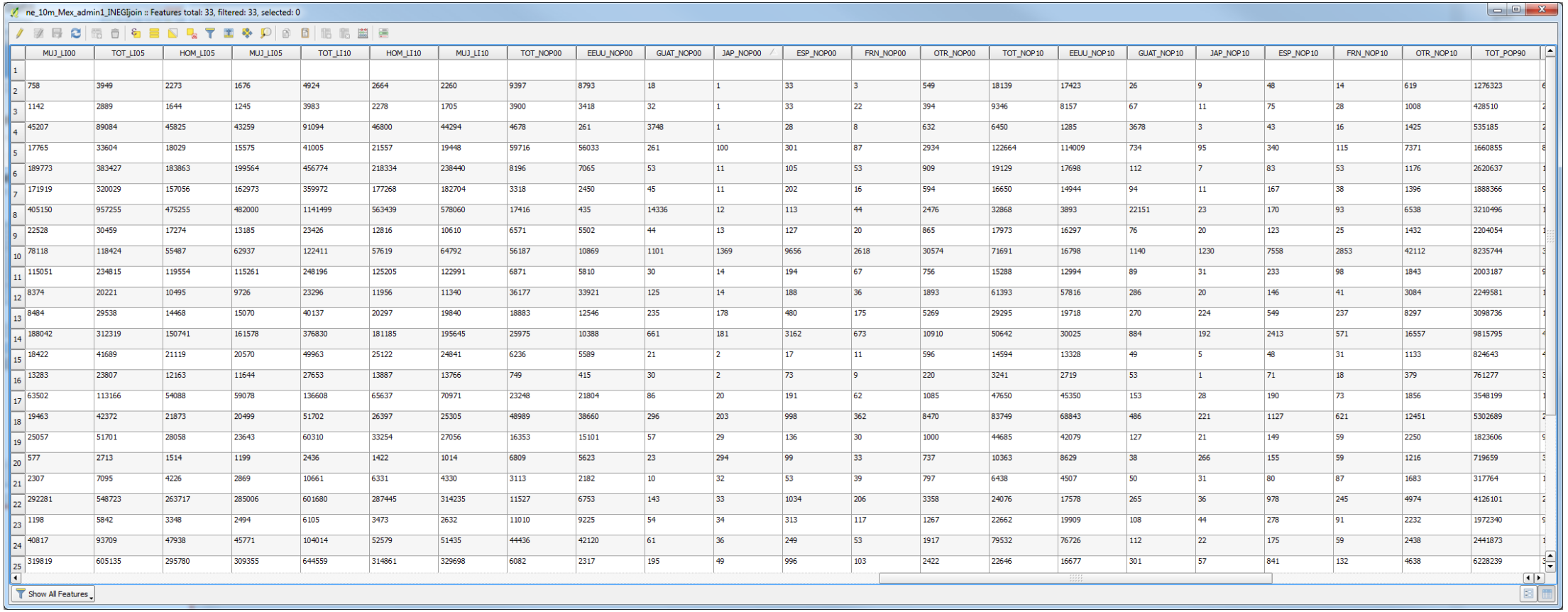
Style
OK
Cancel
Apply
Help



	MUJ_LI00	TOT_LI05	HOM_LI05	MUJ_LI05	TOT_LI10	HOM_LI10	MUJ_LI10	TOT_NOP00	EEUU_NOP00	GUAT_NOP00	JAP_NOP00	ESP_NOP00	FRN_NOP00	OTR_NOP00	TOT_NOP10	EEUU_NOP10	GUAT_NOP10	JAP_NOP10	ESP_NOP10	FRN_NOP10	OTR_NOP10	TOT_POP90	
1																							
2	758	3949	2273	1676	4924	2664	2260	9397	8793	18	1	33	3	549	18139	17423	26	9	48	14	619	1276323	6
3	1142	2889	1644	1245	3983	2278	1705	3900	3418	32	1	33	22	394	9346	8157	67	11	75	28	1008	428510	2
4	45207	89084	45825	43259	91094	46800	44294	4678	261	3748	1	28	8	632	6450	1285	3678	3	43	16	1425	535185	2
5	17765	33604	18029	15575	41005	21557	19448	59716	56033	261	100	301	87	2934	122664	114009	734	95	340	115	7371	1660855	8
6	189773	383427	183863	199564	456774	218334	238440	8196	7065	53	11	105	53	909	19129	17698	112	7	83	53	1176	2620637	1
7	171919	320029	157056	162973	359972	177268	182704	3318	2450	45	11	202	16	594	16650	14944	94	11	167	38	1396	1888366	9
8	405150	957255	475255	482000	1141499	563439	578060	17416	435	14336	12	113	44	2476	32868	3893	22151	23	170	93	6538	3210496	1
9	22528	30459	17274	13185	23426	12816	10610	6571	5502	44	13	127	20	865	17973	16297	76	20	123	25	1432	2204054	1
10	78118	118424	55487	62937	122411	57619	64792	56187	10869	1101	1369	9656	2618	30574	71691	16798	1140	1230	7558	2853	42112	8235744	3
11	115051	234815	119554	115261	248196	125205	122991	6871	5810	30	14	194	67	756	15288	12994	89	31	233	98	1843	2003187	9
12	8374	20221	10495	9726	23296	11956	11340	36177	33921	125	14	188	36	1893	61393	57816	286	20	146	41	3084	2249581	1
13	8484	29538	14468	15070	40137	20297	19840	18883	12546	235	178	480	175	5269	29295	19718	270	224	549	237	8297	3098736	1
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15	18422	41689	21119	20570	49963	25122	24841	6236	5589	21	2	17	11	596	14594	13328	49	5	48	31	1133	824643	4
16	13283	23807	12163	11644	27653	13887	13766	749	415	30	2	73	9	220	3241	2719	53	1	71	18	379	761277	3
17	63502	113166	54088	59078	136608	65637	70971	23248	21804	86	20	191	62	1085	47650	45350	153	28	190	73	1856	3548199	1
18	19463	42372	21873	20499	51702	26397	25305	48989	38660	296	203	998	362	8470	83749	68843	486	221	1127	621	12451	5302689	2
19	25057	51701	28058	23643	60310	33254	27056	16353	15101	57	29	136	30	1000	44685	42079	127	21	149	59	2250	1823606	9
20	577	2713	1514	1199	2436	1422	1014	6809	5623	23	294	99	33	737	10363	8629	38	266	155	59	1216	719659	3
21	2307	7095	4226	2869	10661	6331	4330	3113	2182	10	32	53	39	797	6438	4507	50	31	80	87	1683	317764	1
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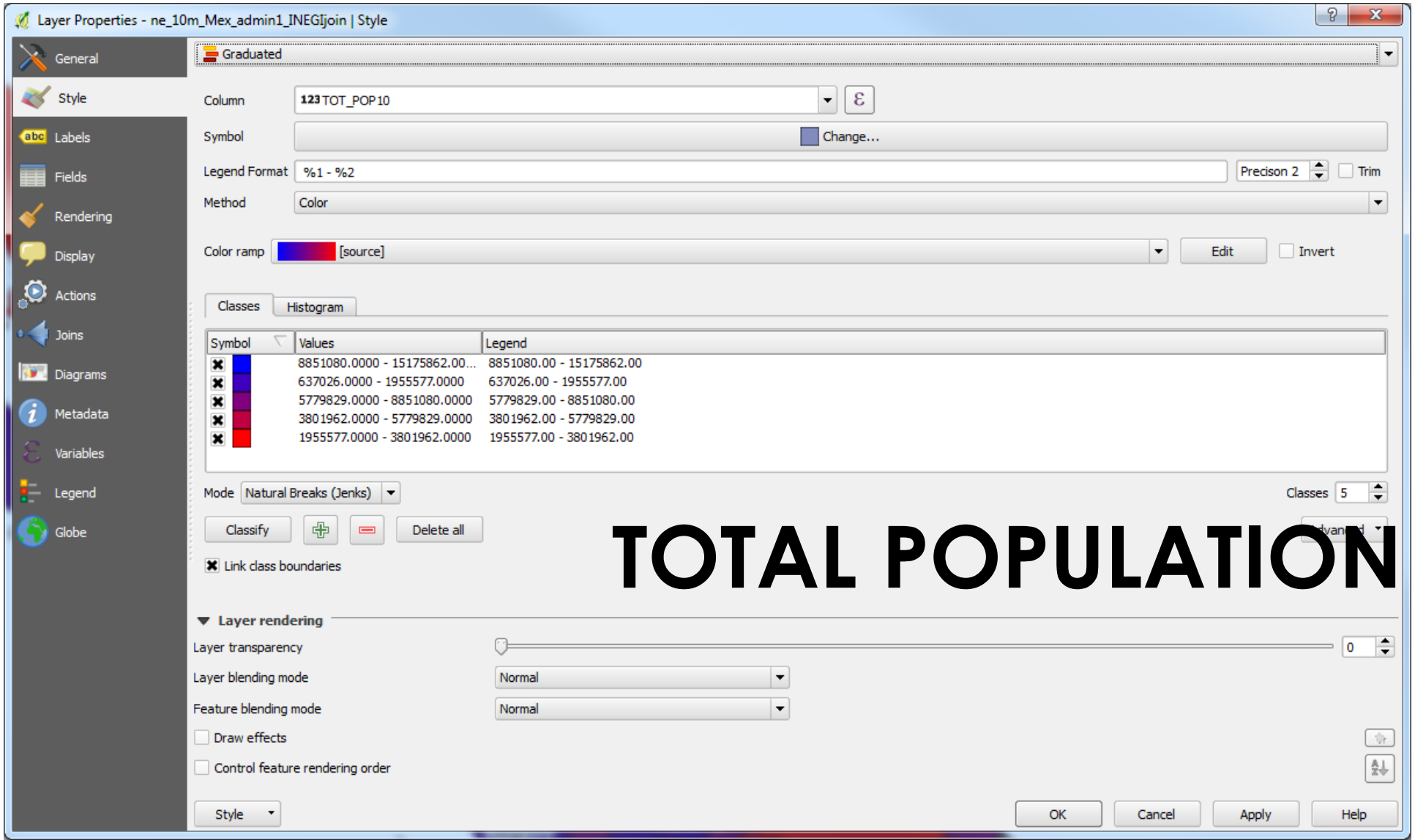
23	1198	5842	3348	2494	6105	3473	2632	11010	9225	54	34	313	117	1267	22662	19909	108	44	278	91	2232	1972340	9
24	40817	93709	47938	45771	104014	52579	51435	44436	42120	61	36	249	53	1917	79532	76726	112	22	175	59	2438	2441873	1
25	319819	605135	295780	309355	644559	314861	329698	6082	2317	195	49	996	103	2422	22646	16677	301	57	841	132	4638	6228239	3

Now the tabular data are linked to the vector data!

¡Ahora los datos tabulares están enlazados a los datos vectoriales!

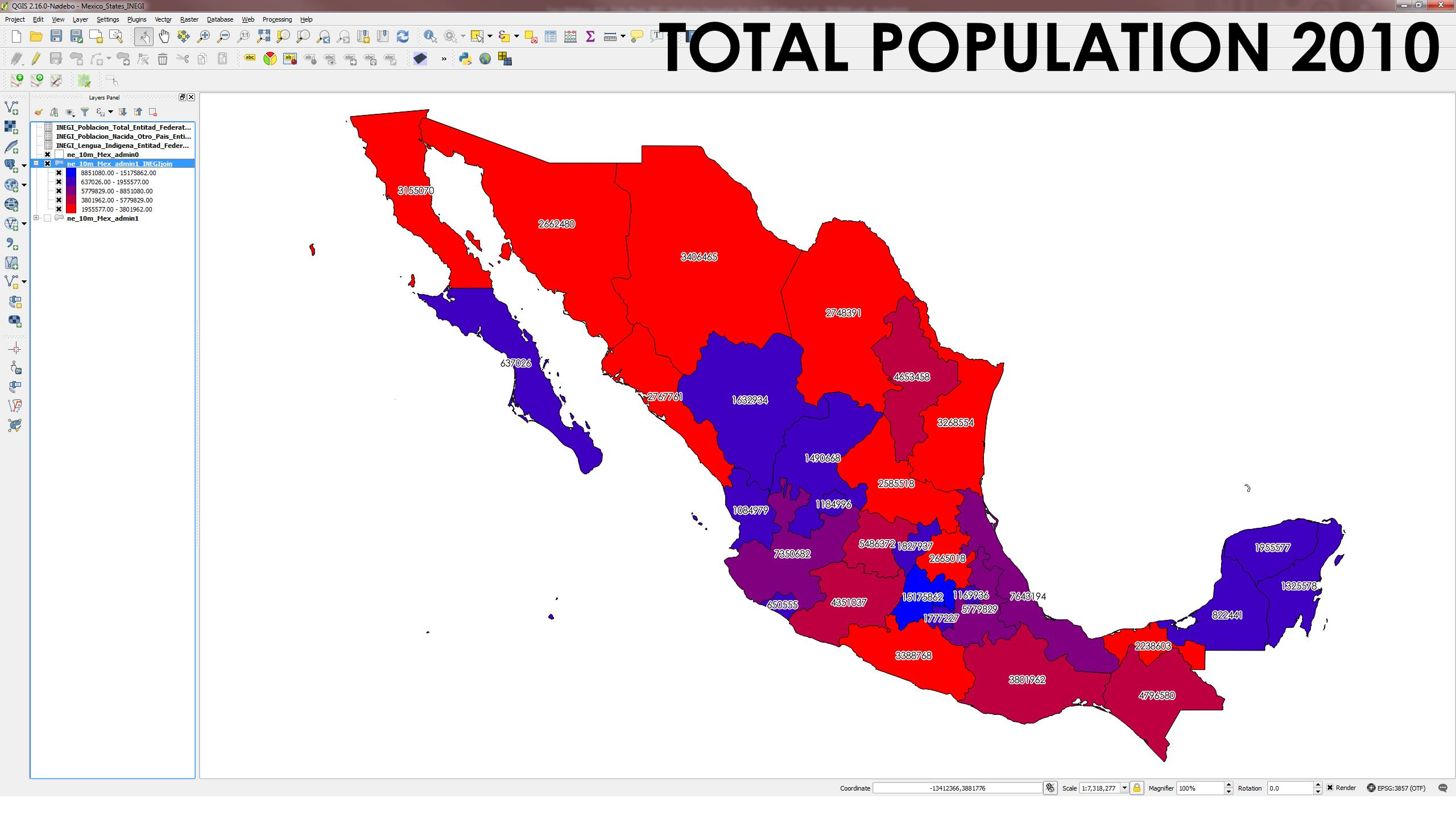
Visualize the Newly Linked Data . . .

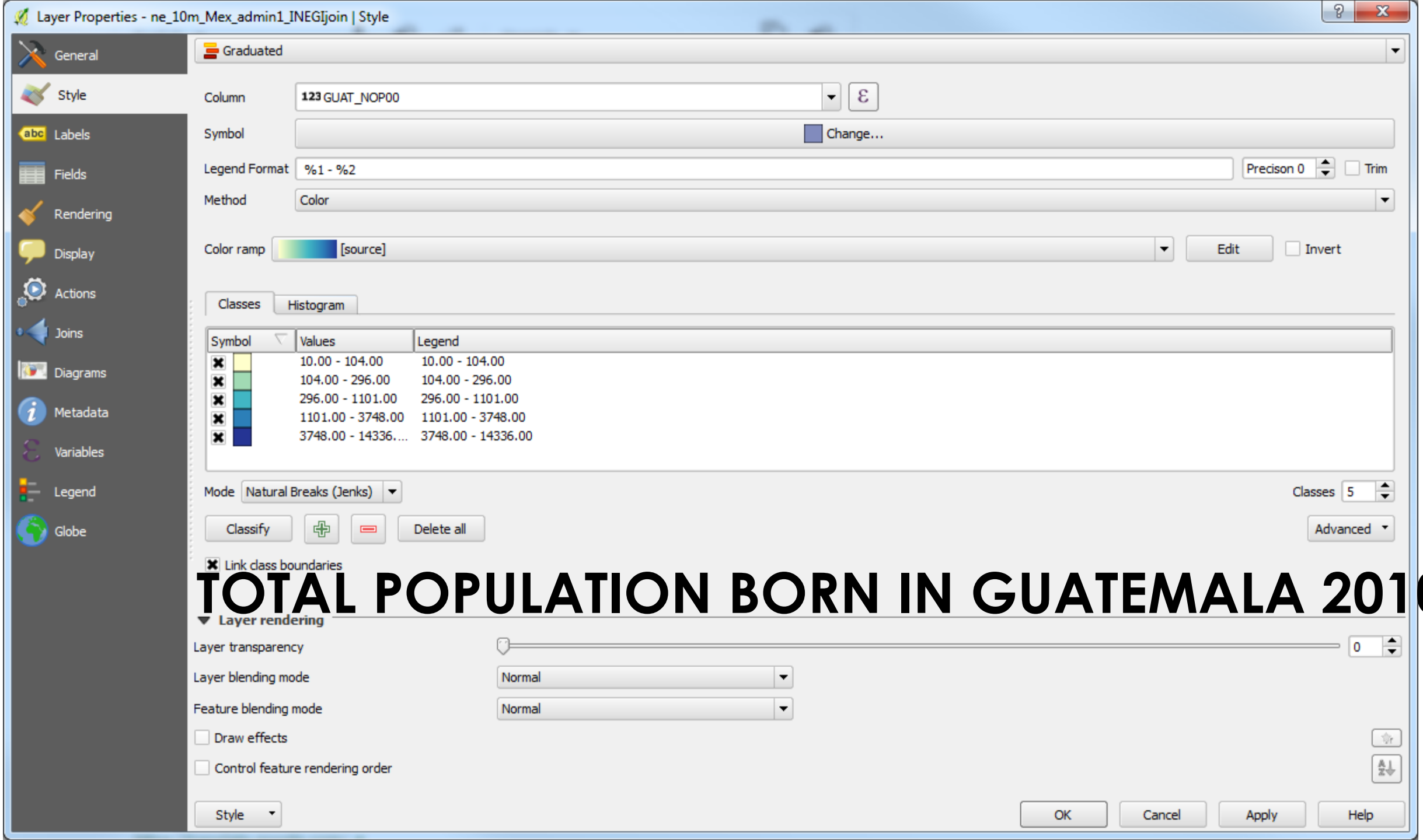
Visualice los nuevos datos vinculados. . .



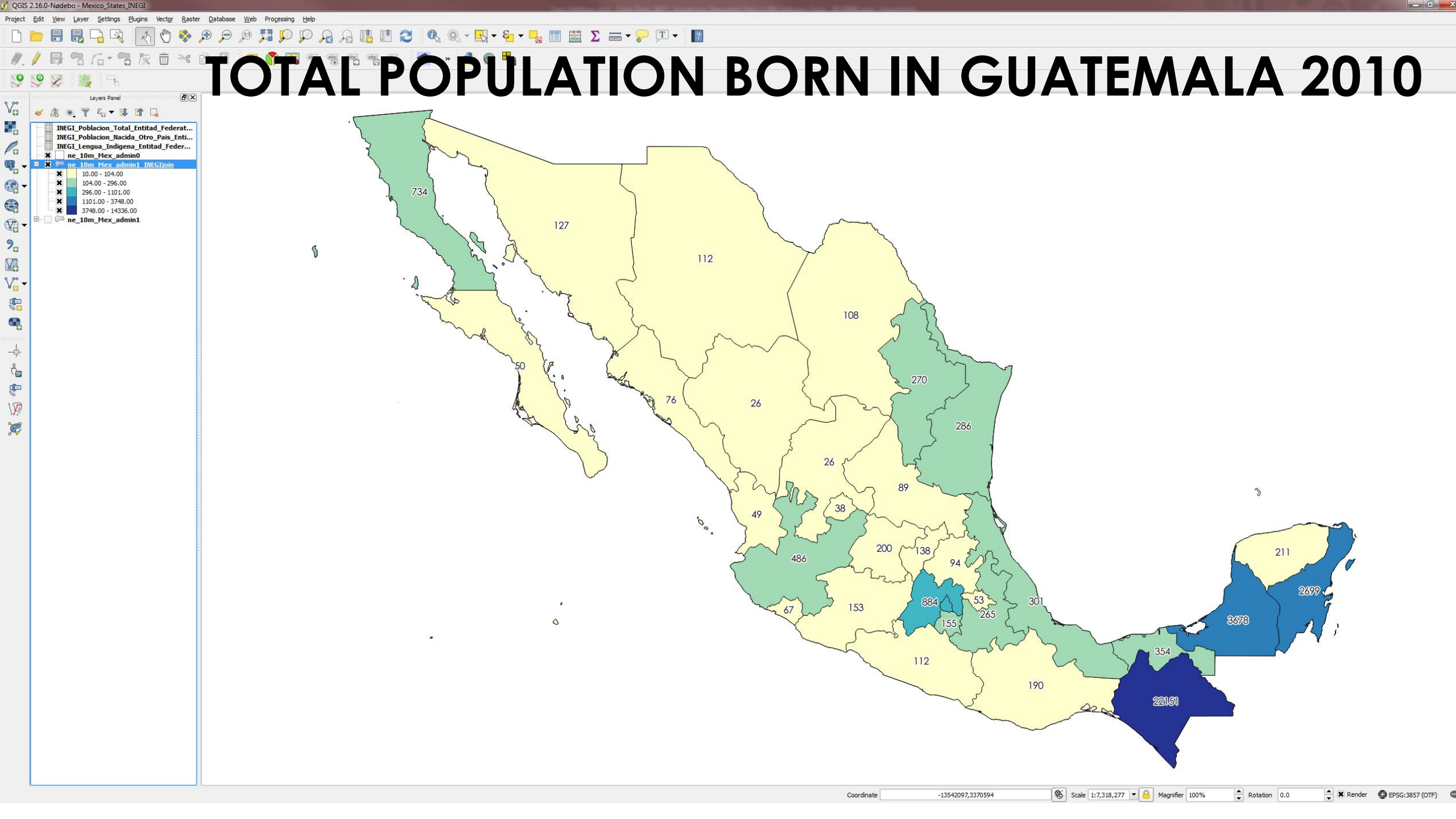
TOTAL POPULATION 2010

TOTAL POPULATION 2010



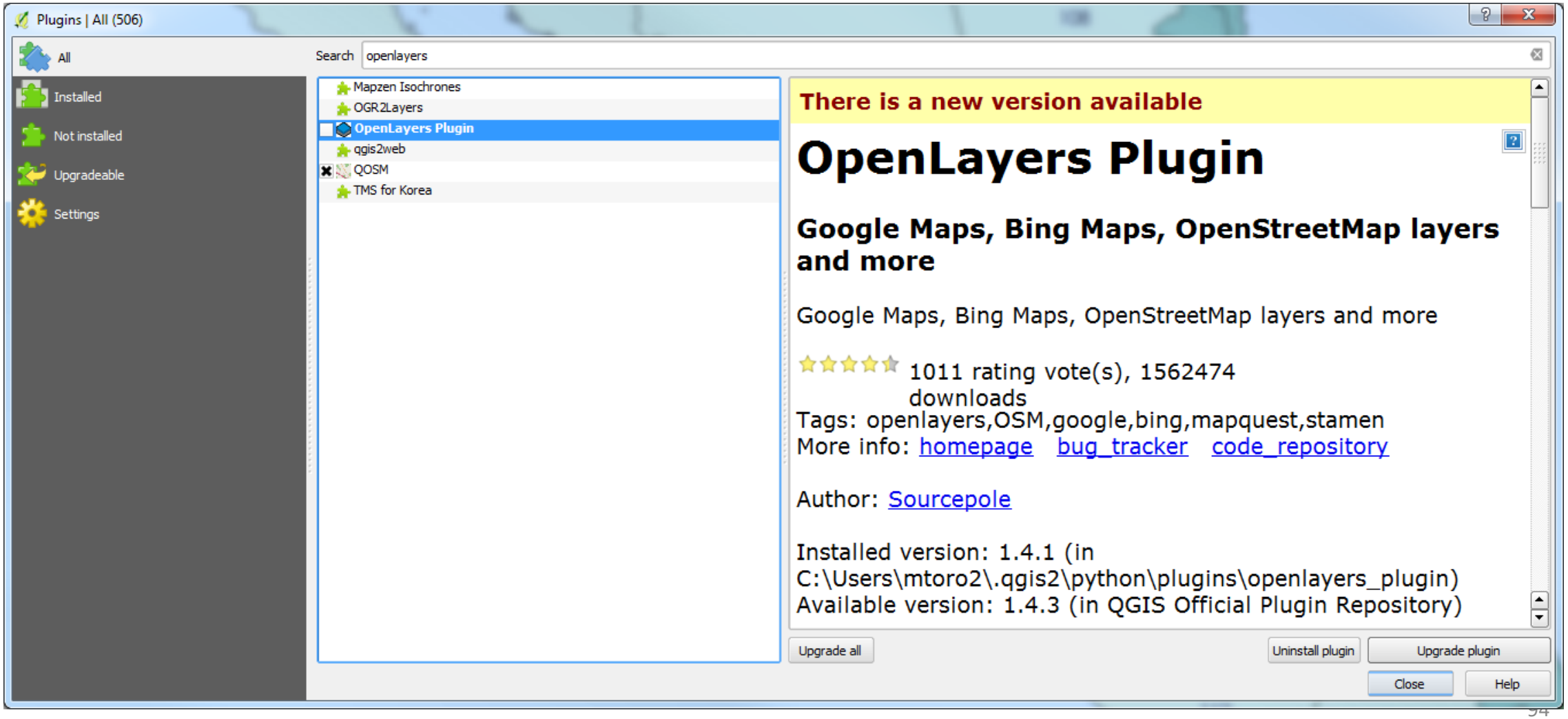

Layer Properties - ne_10m_Mex_admin1_INEGIjoin | Style
General
Style
Labels
Fields
Rendering
Display
Actions
Joins
Diagrams
Metadata
Variables
Legend
Globe
Graduated
Column
123 GUAT_NOP00
Symbol
Change...
Legend Format
%1 - %2
Precison 0
Trim
Method
Color
Color ramp
[source]
Edit
Invert
Classes
Histogram
Symbol
Values
Legend
10.00 - 104.00
104.00 - 296.00
296.00 - 1101.00
1101.00 - 3748.00
3748.00 - 14336....
10.00 - 104.00
104.00 - 296.00
296.00 - 1101.00
1101.00 - 3748.00
3748.00 - 14336.00
Mode
Natural Breaks (Jenks)
Classes
5
Classify
Delete all
Advanced
Link class boundaries
TOTAL POPULATION BORN IN GUATEMALA 2010
Layer rendering
Layer transparency
0
Layer blending mode
Normal
Feature blending mode
Normal
Draw effects
Control feature rendering order
Style
OK
Cancel
Apply
Help

TOTAL POPULATION BORN IN GUATEMALA 2010



Add a Basemap from the Web . . .

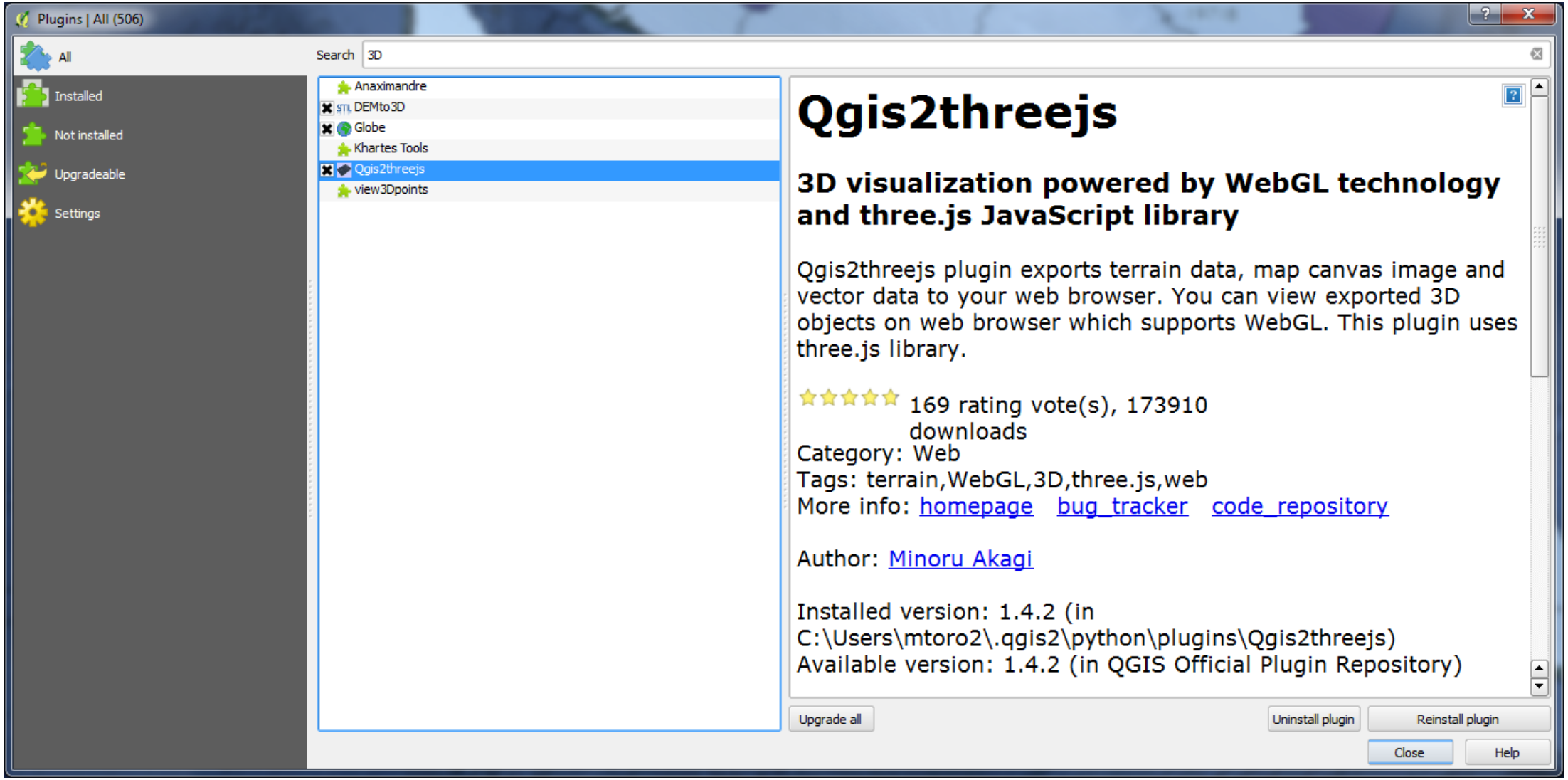
Agregue un Basemap desde la Web. . .

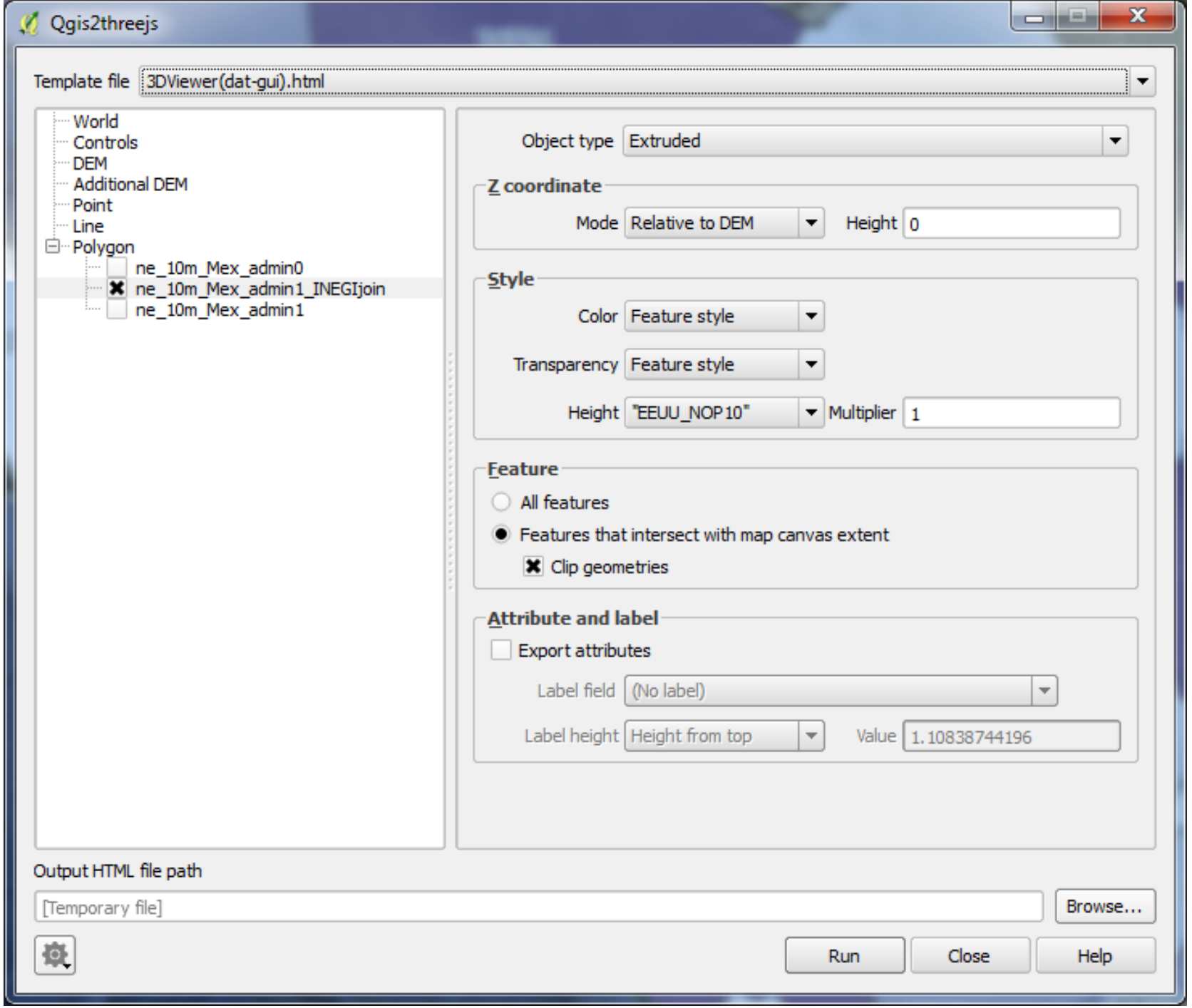


QGIS 2.16.0-Nødebo - Mexico_States_INEGI
Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Help
TOTAL POPULATION BORN IN USA 201
Layers Panel
INEGI_Poblacion_Total_Entitad_Federat...
INEGI_Poblacion_Nacida_Otro_Pais_Enti...
INEGI_Lengua_Indigena_Entitad_Feder...
ne_10m_Mex_admin0
ne_10m_Mex_admin1_INEGIjoin
1285 - 8629
8629 - 19909
19909 - 45350
45350 - 76726
76726 - 114009
Google Satellite
ne_10m_Mex_admin1
114009
42079
76726
19909
4507
19718
16297
14160
57816
17423
12994
8629
13328
33816
6957
68843
14944
2708
3980
45350
30025
2719
16677
8157
17578
1285
12403
1519
17698
15158
3893
Google
Coordinate -12945719,3912757
Scale 1:7,318,277
Magnifier 100%
Rotation 0.0
Render
EPSG:3857 (O

Export to 3D Web Viewer . . .

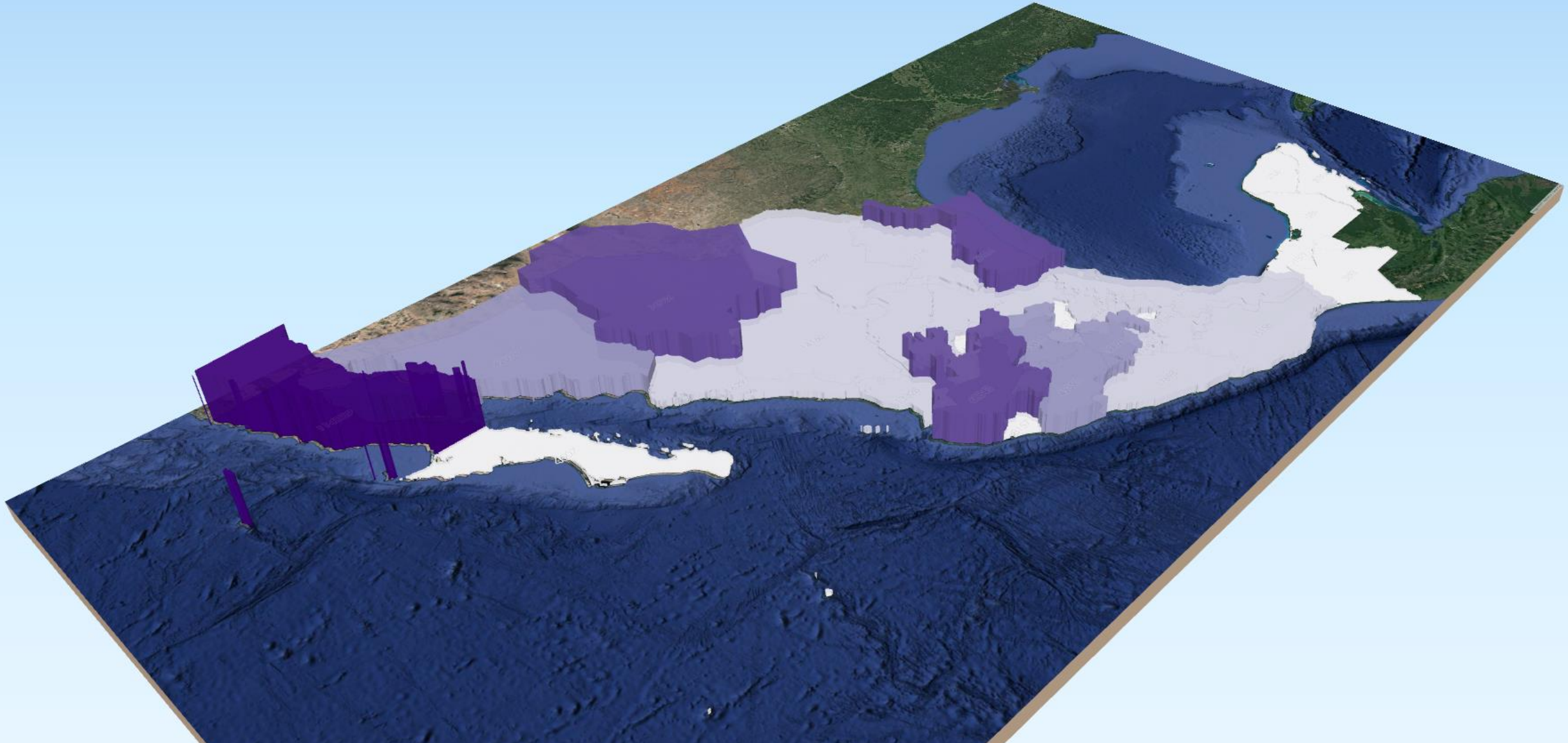
Exportar a 3D Web Viewer. . .




Qgis2threejs
Template file
3DViewer(dat-gui).html
World
Controls
DEM
Additional DEM
Point
Line
Polygon
ne_10m_Mex_admin0
ne_10m_Mex_admin1_INEGIjoin
ne_10m_Mex_admin1
Object type
Extruded
Z coordinate
Mode
Relative to DEM
Height
0
Style
Color
Feature style
Transparency
Feature style
Height
"EEUU_NOP10"
Multiplier
1
Feature
All features
Features that intersect with map canvas extent
Clip geometries
Attribute and label
Export attributes
Label field
(No label)
Label height
Height from top
Value
1.10838744196
Output HTML file path
[Temporary file]
Browse...
Run
Close
Help

TOTAL POPULATION BORN IN USA 2010

POBLACIÓN TOTAL NACIDA EN EE.UU. 2010

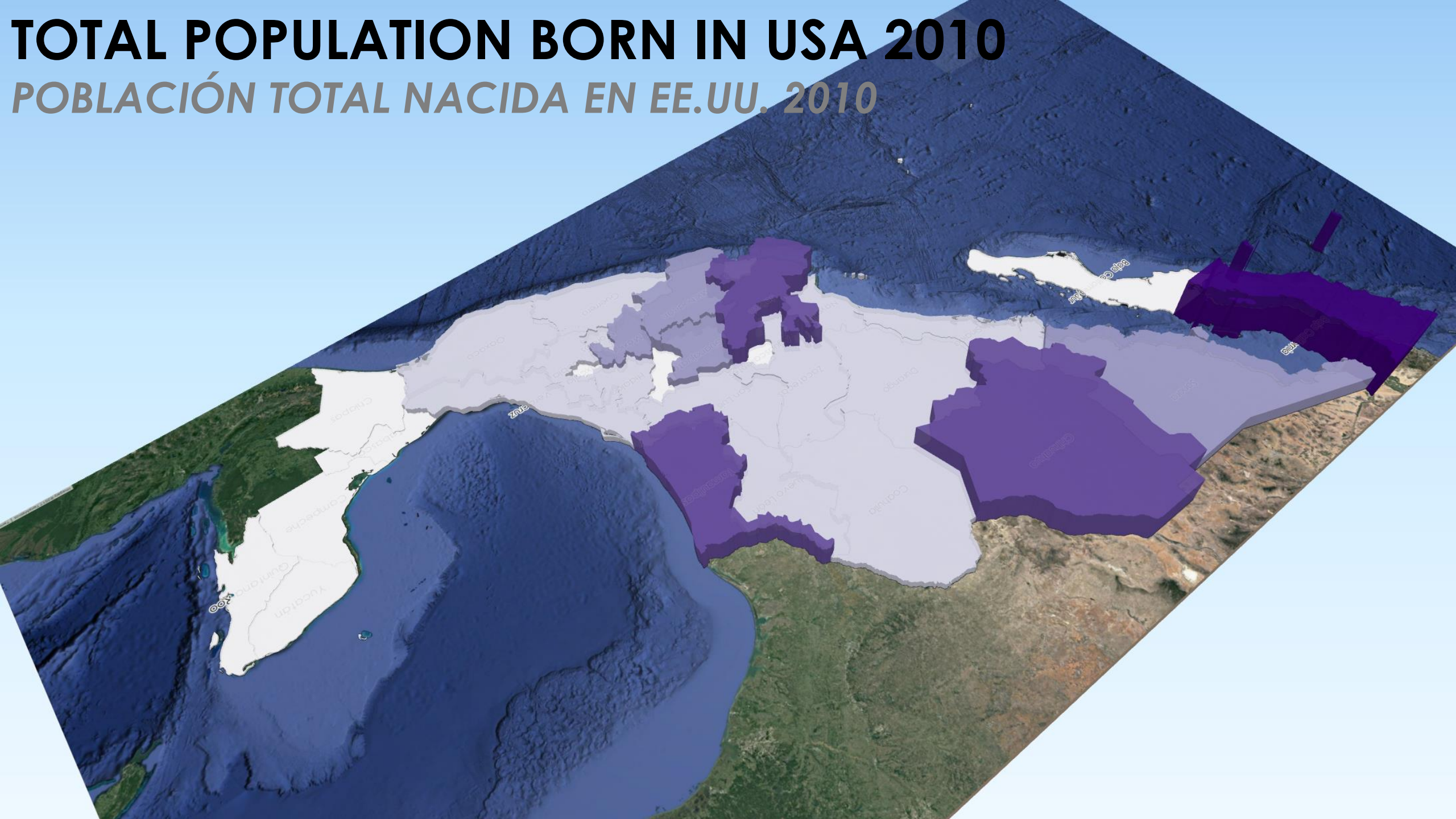


Great work!

¡Buen trabajo!

TOTAL POPULATION BORN IN USA 2010

POBLACIÓN TOTAL NACIDA EN EE.UU. 2010



Questions?

¿Preguntas?

ASU Library
Arizona State University

Map and Geospatial Hub

Visualizing Geospatial Data with GIS Software Tools

Visualización de Datos Geoespaciales con Herramientas de SIG

Matthew Toro
Matthew.Toro@asu.edu

2017 / 09 / 04

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