

Geographic Information Systems: Spatial analysis of geolocalized data

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Universidad Complutense de Madrid



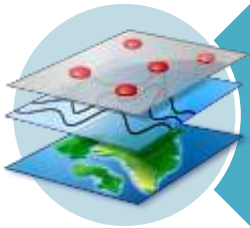
¿What is a geographic information system (GIS)?



Key concepts of GIS



¿What can we do with a GIS?



Software

Maps | Thematic maps

EL PAÍS SECCIONES

24M ELECCIONES

AUTONÓMICAS MUNICIPALES **RESULTADOS** GRÁFICOS EN LAS REDES WIDGET

RESULTADOS 2015 IR A RESULTADOS 2011 IR A RESULTADOS 2007

RESULTADOS ELECTORALES 2015

AUTONÓMICAS > ACTUALIZADO: 27/5/2015 17:19

■ PSOE ■ PP ■ Otros

Elige comunidad... ▾

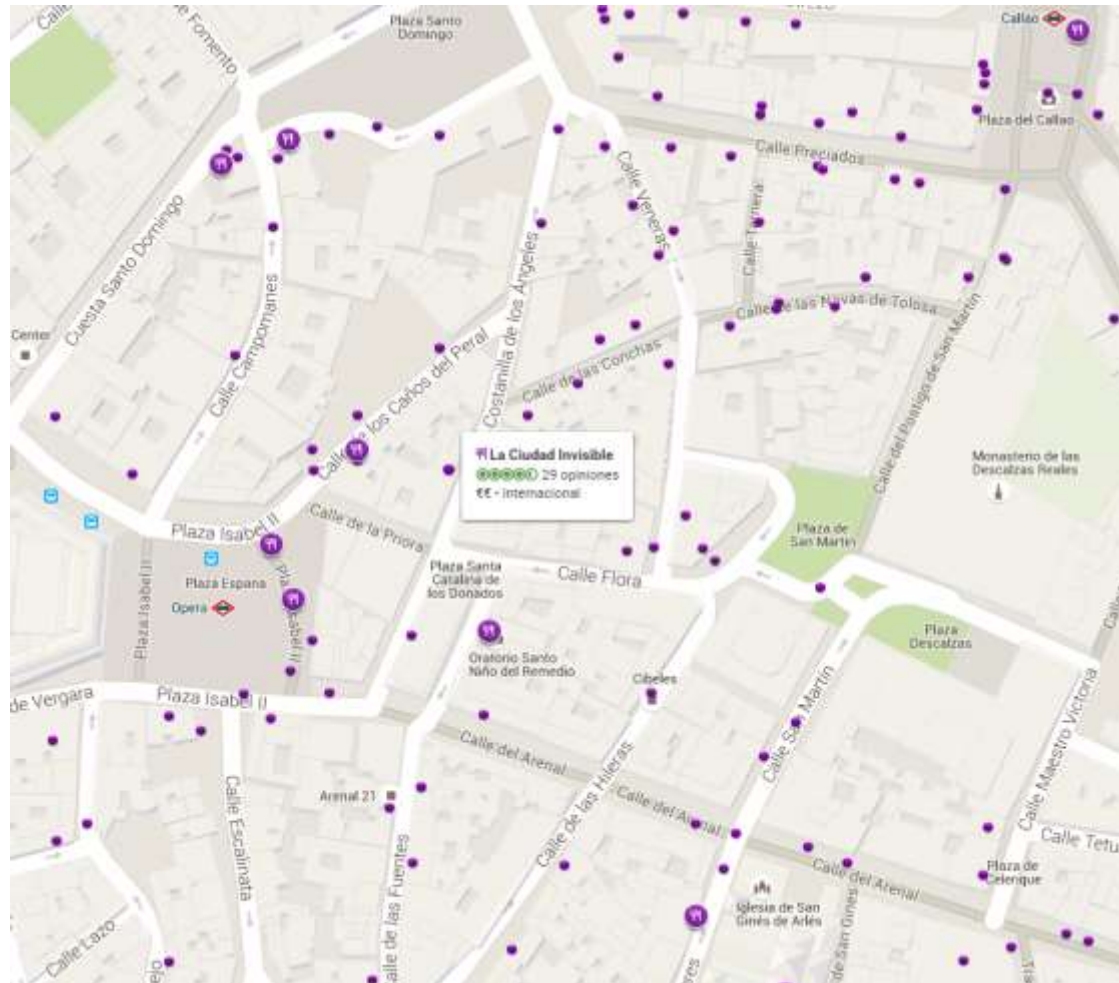
MUNICIPALES > Ver resultados totales > ACTUALIZADO: 27/5/2015 16:38

■ PSOE ■ PP ■ Otros

🔍 | Nombre del municipio

<http://resultados.elpais.com/elecciones/autonomicas-municipales.html>

Interactive maps



Interactive maps

The screenshot displays the Foursquare mobile application interface. At the top, there is a search bar with the text "Estoy buscando..." and a "Vista actual del mapa" button. Below the search bar, the text "Sugerencias para Compras cerca de Madrid" is visible. A navigation bar contains filters: "Especiales", "No he estado", "Siguiendo", "Precio", "Abierto ahora", "Guardado", and "Me gusta". A promotional banner reads "Descubre lugares que les encantan a tus amigos y expertos" with buttons for "Regístrate con Facebook" and "Regístrate con tu email".

The main content area shows a list of recommendations:

- 1. Mercado de Maravillas**
C/ Bravo Murillo, 122
Mercado de productos de granja
8.8 rating
"la mejor carne asturiana en el puesto de Gonzalo!226" (13 tips)
"... camicerías, pescaderías..., tradicionales." (3 tips)
Guardar
- 2. Bodega Santa Cecilia**
C/ Btaico de Garay, 74
Tienda de vinos
8.5 rating
"El parking para clientes un plus sobre todo x la zona." (3 tips)
"Con parking anexo para clientes :-)" (2 tips)
Guardar

The right side of the image shows a map of the area with several numbered blue location pins (5, 8, 11, 21, 22, 24, 25, 28, 29) and a detailed popup for a location named "Blanco" (C/ Princesa, Ropa).

Interactive services

The image shows a Google Maps interface with a transit route highlighted. The route starts at 'Universidad Complutense de Madrid' and ends at 'Indizen, Paseo de la Castellana, 130, 281'. The estimated travel time is 35 minutes, with a frequency of every 10 minutes. The route is primarily on the M-30 highway, with a short walking segment at the end. The map shows various neighborhoods in Madrid, including Moncloa-Aravaca, Vallehermoso, Chamberí, and Salamanca. The left sidebar contains navigation icons, the origin and destination addresses, and two alternative transit options with their respective durations: 35 minutes and 1 hour 4 minutes. The bottom right corner shows the Google logo and map data information.

Universidad Complutense de Madrid: Fin
Indizen, Paseo de la Castellana, 130, 281

Salir ahora OPCIONES

20:58-21:33 35 min
21:19 desde Ciudad Universitaria
21 min cada 10 min
DETALLES

20:58-22:02 1 h 4 min

EXPLORADOR DE HORARIOS

<https://www.google.es/maps>

Social networks

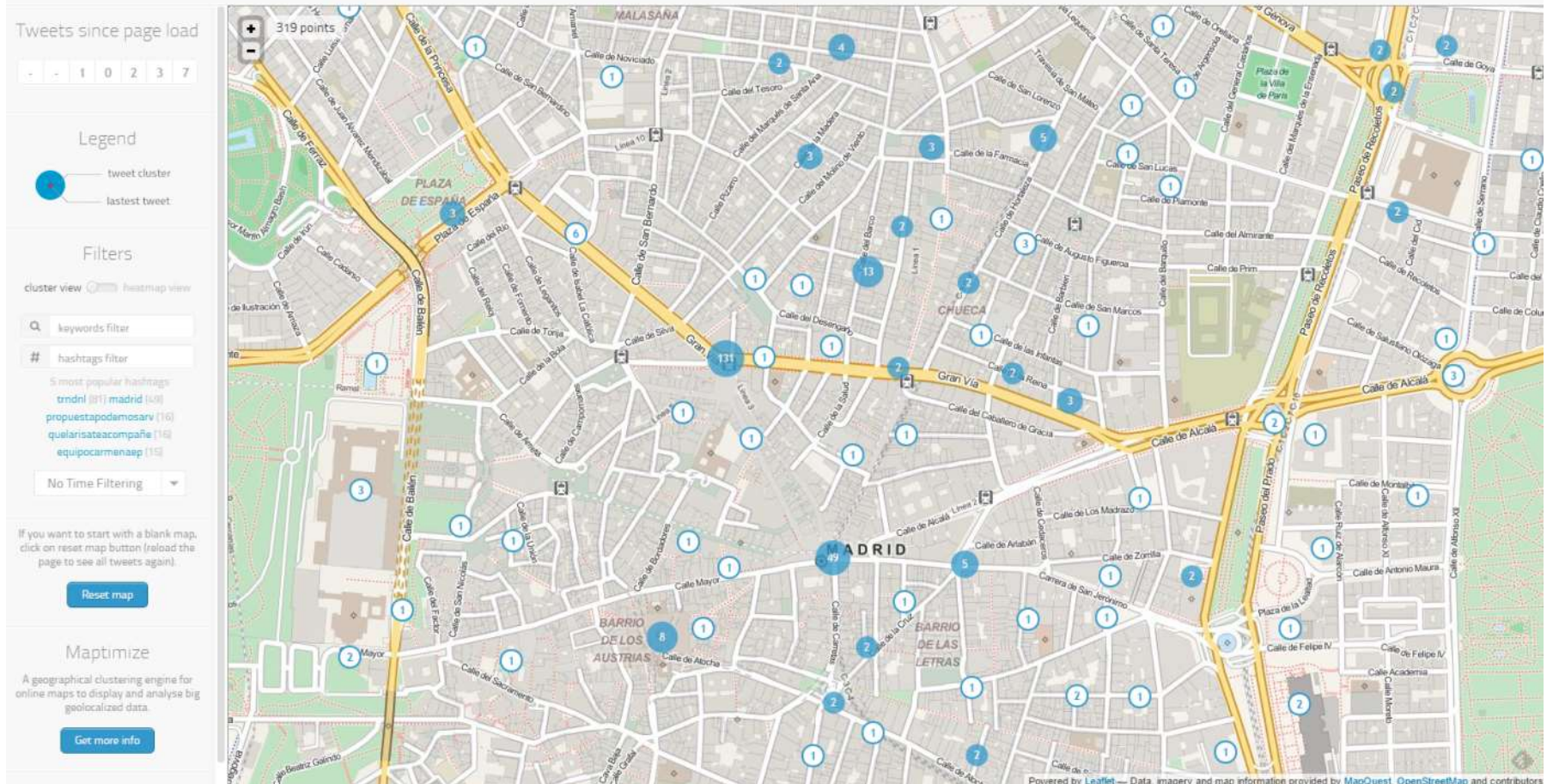


<http://www.panoramio.com/map/#lt=43.103427&ln=-4.134293&z=7&k=0&a=1&tab=1&pl=all>

Social networks

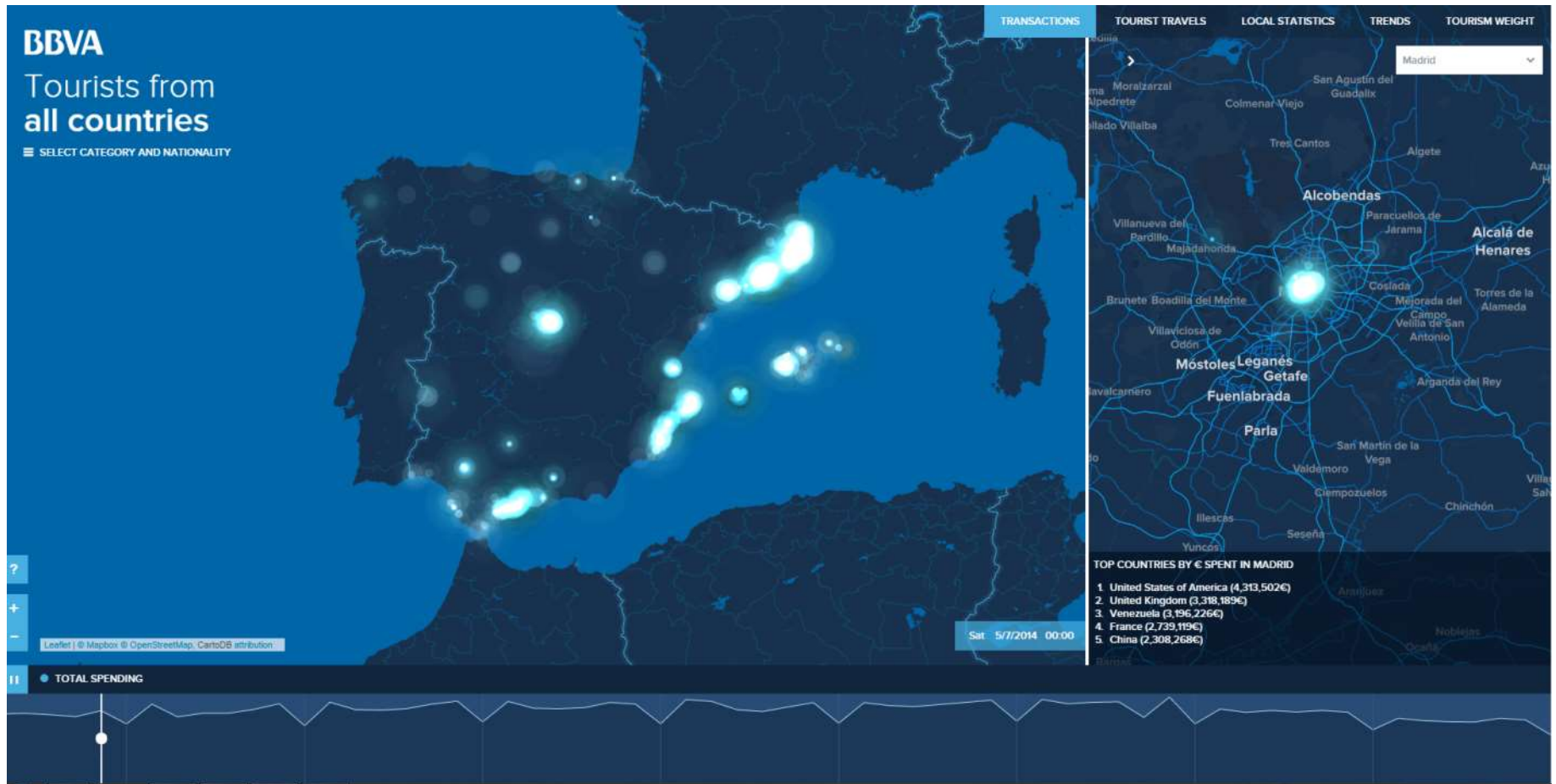
The one million tweet map

powered by **maptimize**



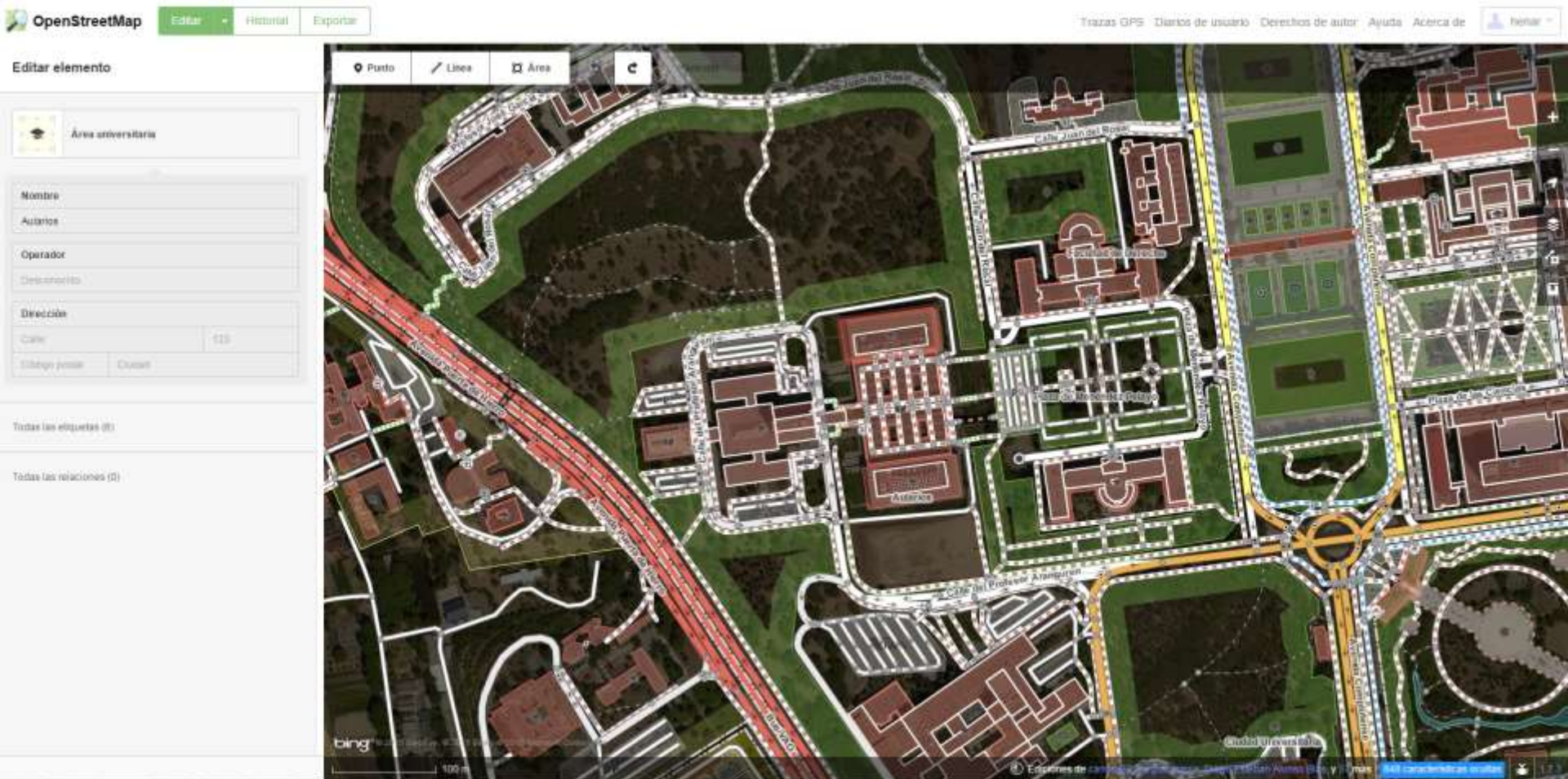
<http://onemilliontweetmap.com/>

Dynamic maps



<http://bbvatourism.vizzuality.com/>

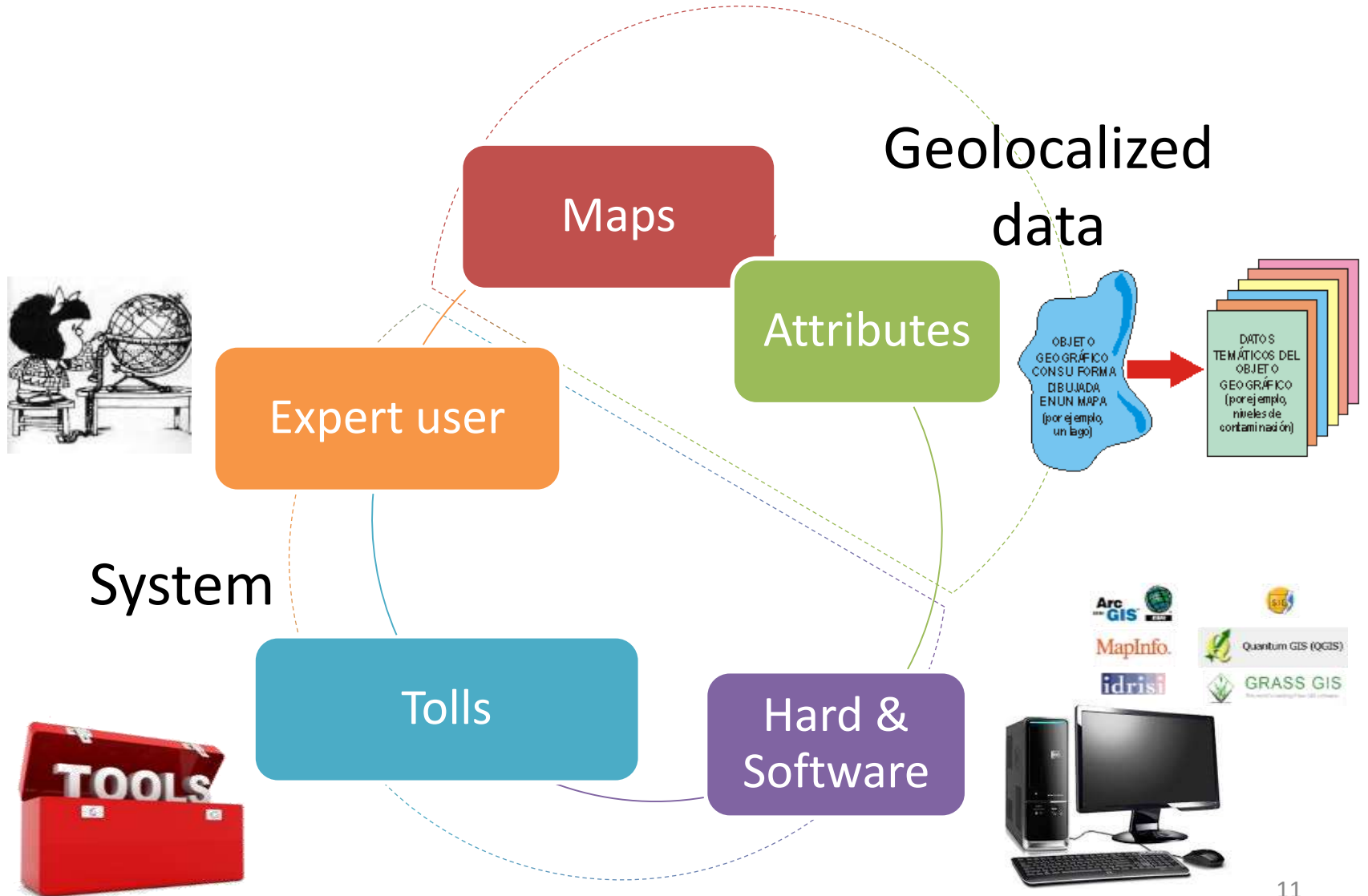
Collaborative mapping

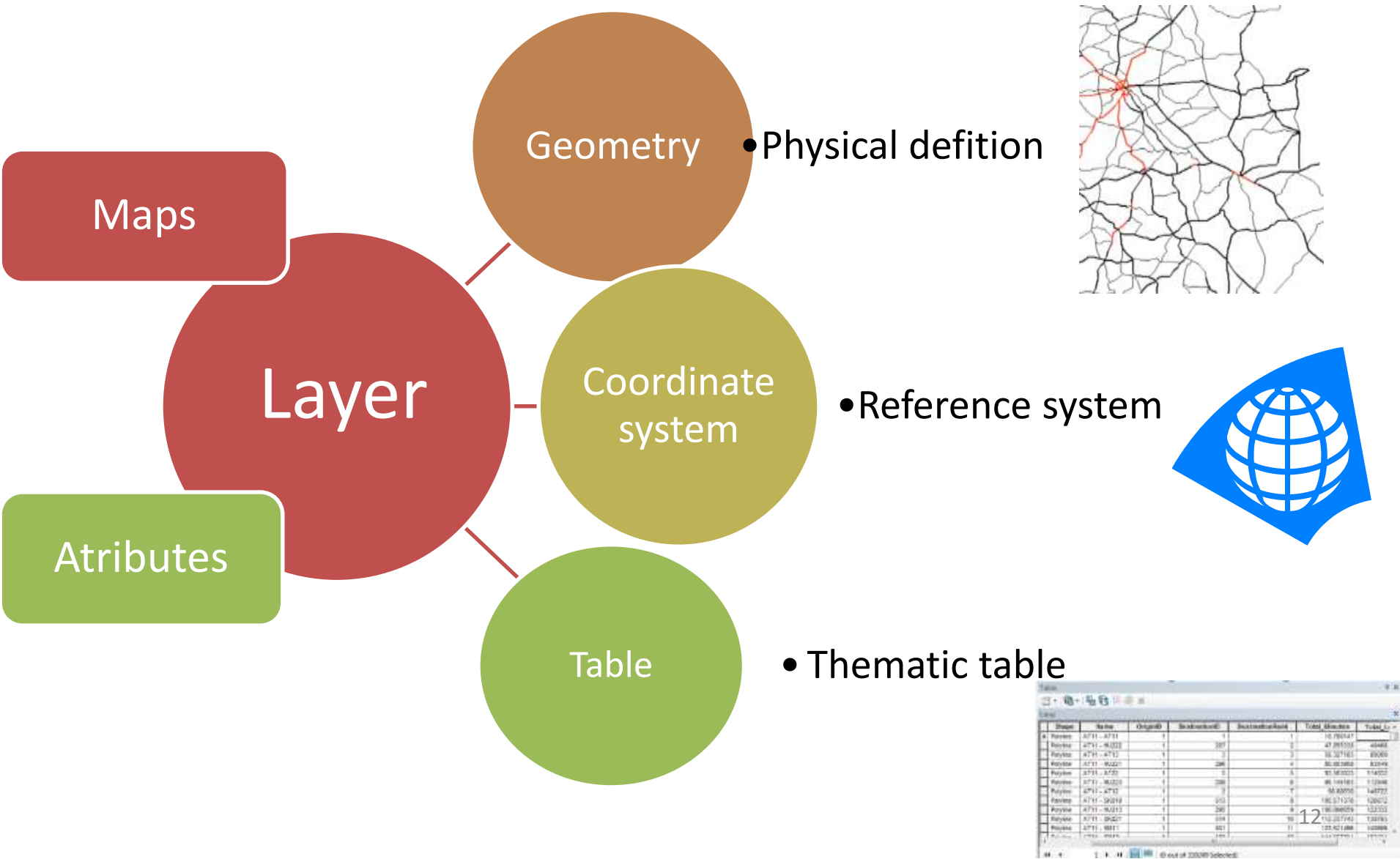


<http://www.openstreetmap.org>



Geographic information system





Shape	Name	Objektid	Inneninhalt	Inneninhalt	Total Flächen	Total
Polygon	AT11 - AT11	1			10 70047	
Polygon	AT11 - AT12	1	397		47 26556	48663
Polygon	AT11 - AT13	1	2		16 30745	65060
Polygon	AT11 - AT21	1	236		30 68269	82496
Polygon	AT11 - AT22	1	2		11 36225	93821
Polygon	AT11 - AT23	1	398		49 19419	143040
Polygon	AT11 - AT31	1	3		45 60076	148717
Polygon	AT11 - AT32	1	253		180 57120	328872
Polygon	AT11 - AT33	1	240		180 08059	509031
Polygon	AT11 - AT41	1	244		112 23793	621364
Polygon	AT11 - AT42	1	411		122 42188	743852
Polygon	AT11 - AT43	1	244		112 23793	856145

12

Layer

Vector

Raster

Point

Line

Polygon

Malla

Firms

Metro stations

streets

Metro lines

Census tracks

Regions

Satellite images

Digital elevation models

Population grid



Layer

Reference system

Geographic coordinate system

Projected coordinate system

Longitude

Latitude

X

Y

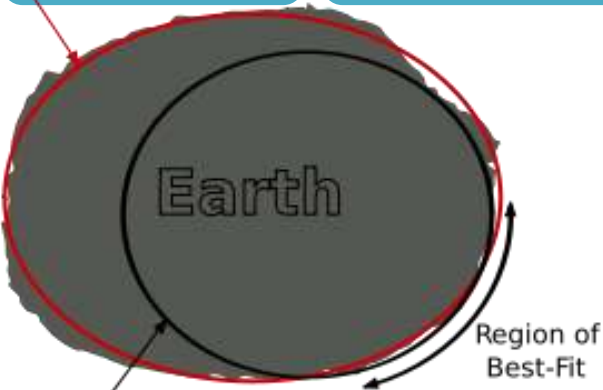
Grade

Grade

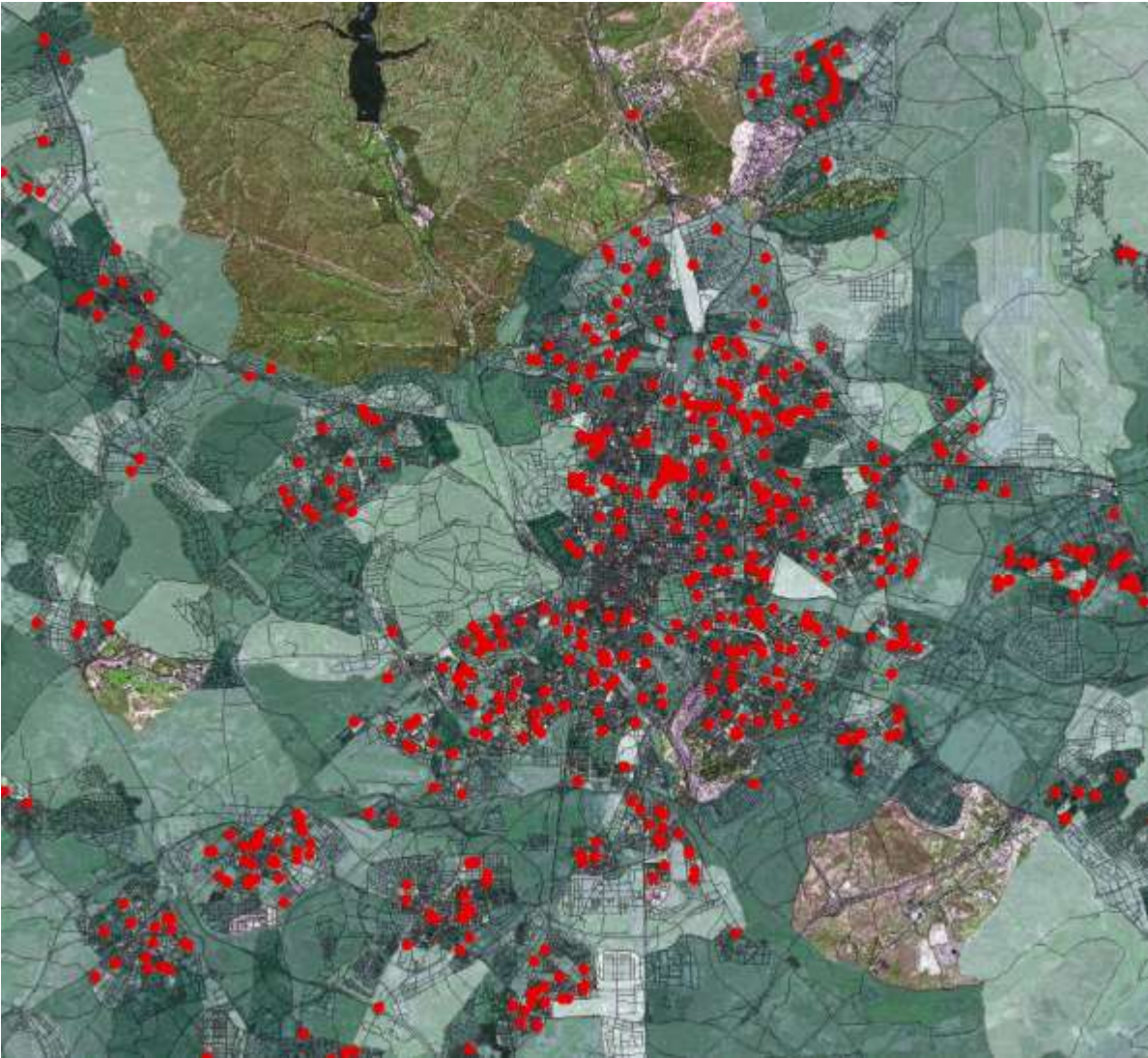
Meters

Meters

Global Best-Fit Ellipsoid



Combine different data types – spatial analysis and geostatistics





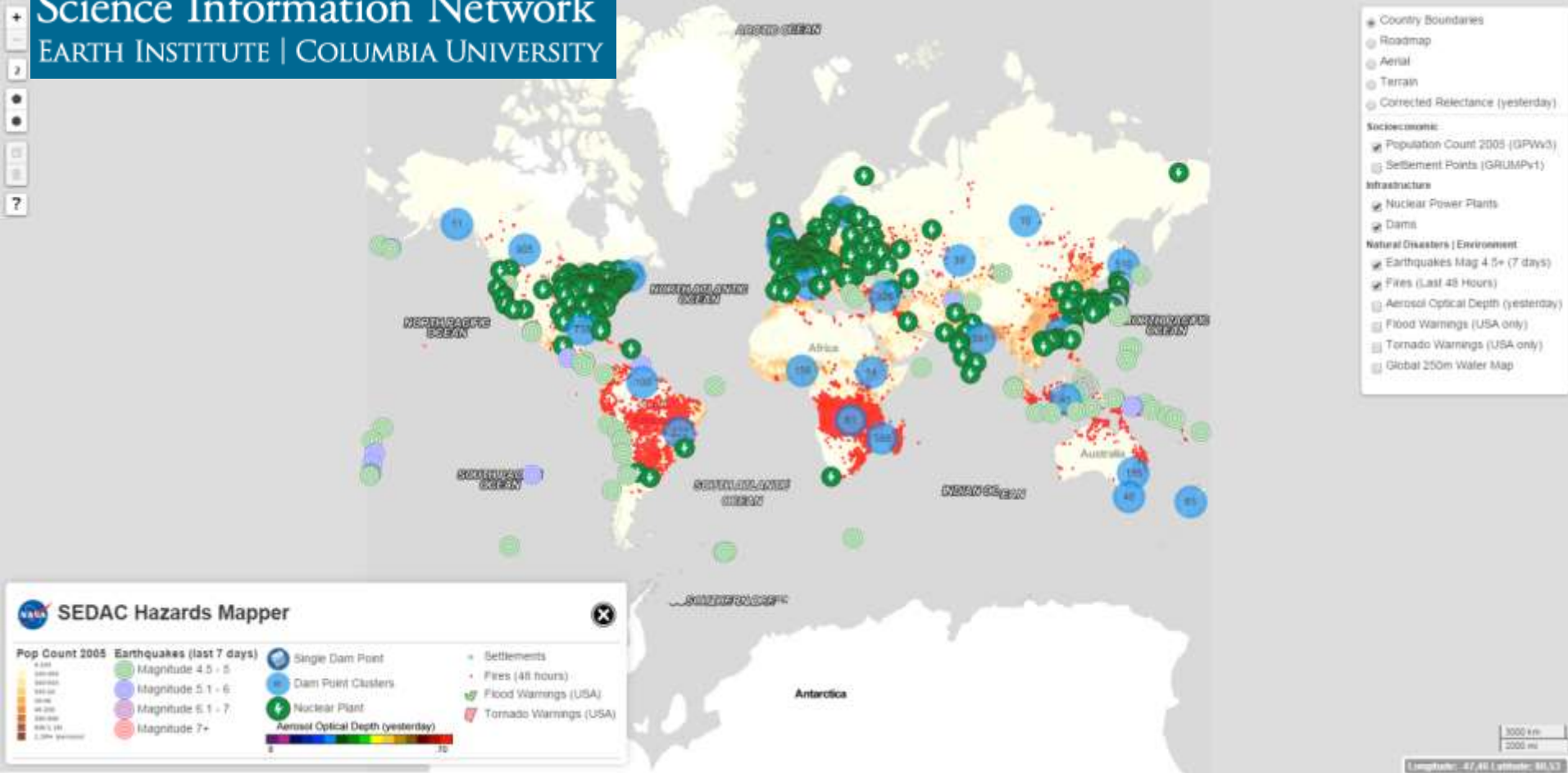
- Conversion
- Projections
- Edition
- Overlay y aggregation
- Measurements y spatial analysis
- Conectivity

Map events



¿What can we do with a GIS?

Center for International Earth
Science Information Network
EARTH INSTITUTE | COLUMBIA UNIVERSITY



<http://sedac.ciesin.columbia.edu/mapping/hazards/>

Geomarketing

Identify key opportunities for marketing strategies



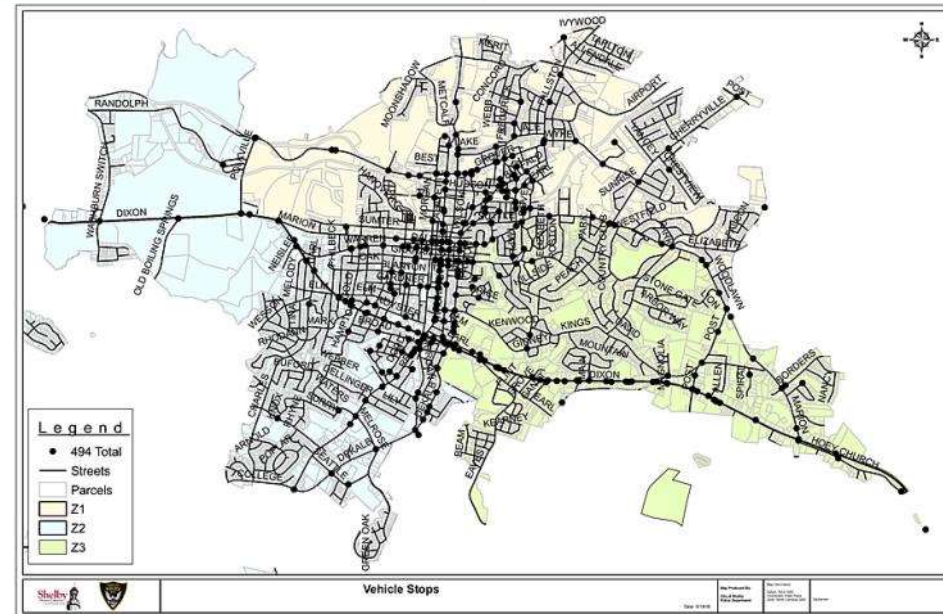
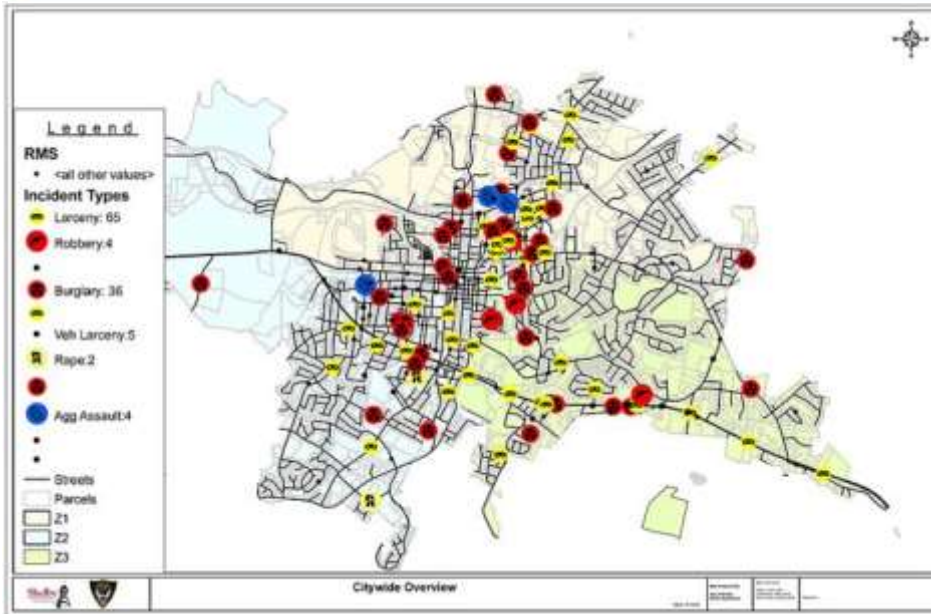
Plan sales routes, analyse service areas, identify potential clients, etc.

<http://marketingenredesociales.com/que-es-y-para-que-sirve-el-geomarketing.html/>

Analyse crime and citizens security

Highlights

- Staff uses GIS-generated intelligence for improved decision making.
- Integrated databases provide a complete information source.
- Visualized data helps community collaboration.



<http://www.esri.com/news/arcnews/summer08articles/intelligence-led.html>

https://drive.google.com/open?id=0B_bcMfROH5NVNzZZYmRwbmotWDg

Health

The Health and Environment Linkages Initiative (HELI)



World Health Organization



Search

Maps and spatial information technologies (Geographical Information Systems) in health and environment decision-making

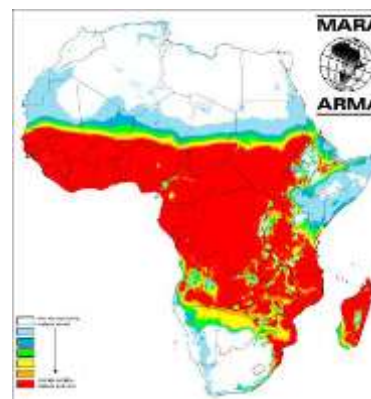
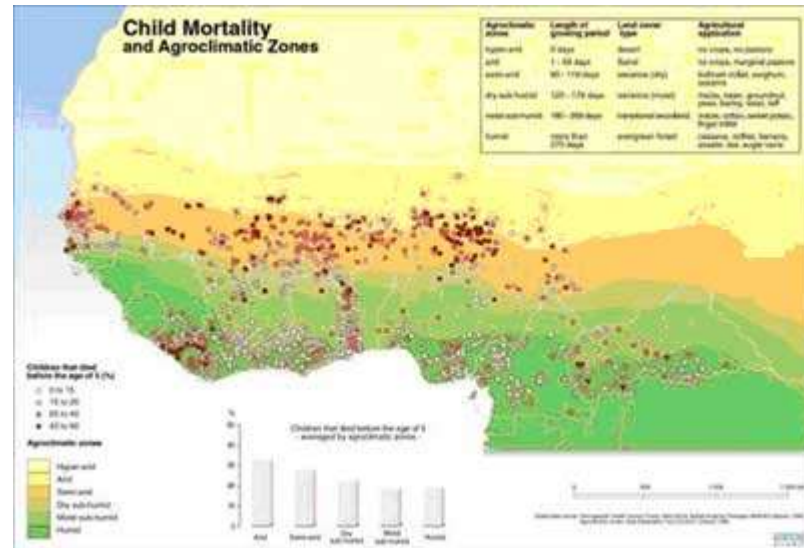
Health and Environment Linkages Policy Series

This policy brief relates to the use of spatial representation of environmental information, and how such techniques can support the integrated analysis of health and environment data, as well as presentation of summary information. This paper reviews the strengths and weaknesses of maps and mapping techniques, provides some key illustrations and case studies, and lists some of the major information sources.

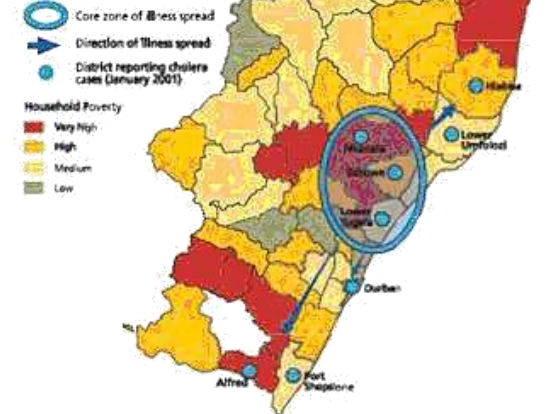
Why use maps?

Maps and spatial information technologies have three main advantages:

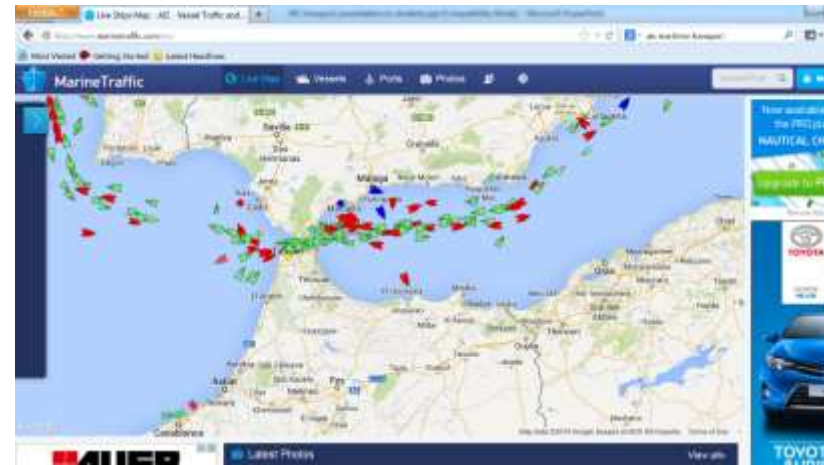
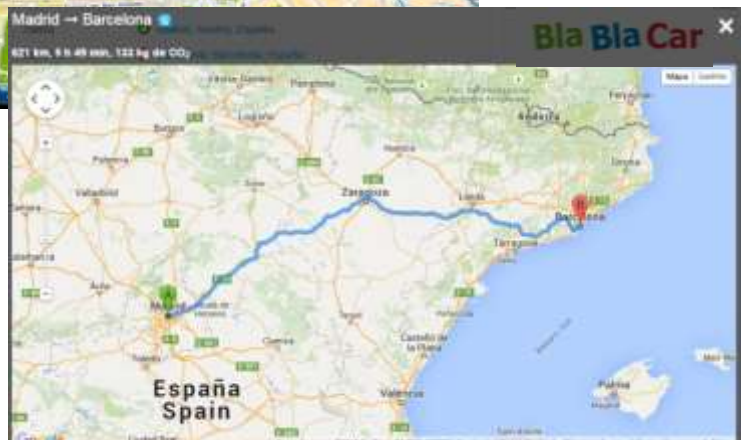
- **They can be a means of recording and storing information.** Governments, the private sector, development agencies, and civil society groups store large quantities of information about the environment and the location of natural resources, as well as about populations and demographic trends.
- **They can be used to identify and investigate spatial patterns.** Maps draw attention to spatial relationships, for example the distribution of a resource over space, over time, or in relation to other factors such as the presence or growth of human settlements. Once these relationships are recognized, we can start to analyse them and search for the underlying causes and processes, which in turn can be useful in improving planning and development.
- **They are effective in presenting information and communicating findings.** Maps allow us to convey information and findings that are difficult to express verbally, or to condense messages that would be lengthier to describe in words. They are often more memorable, because they have colour and shape. They can be used to demonstrate relationships in a way that is more striking – by showing the intensity of a problem in one area relative to the intensity in another area, or by showing the change in distribution of a resource over time.

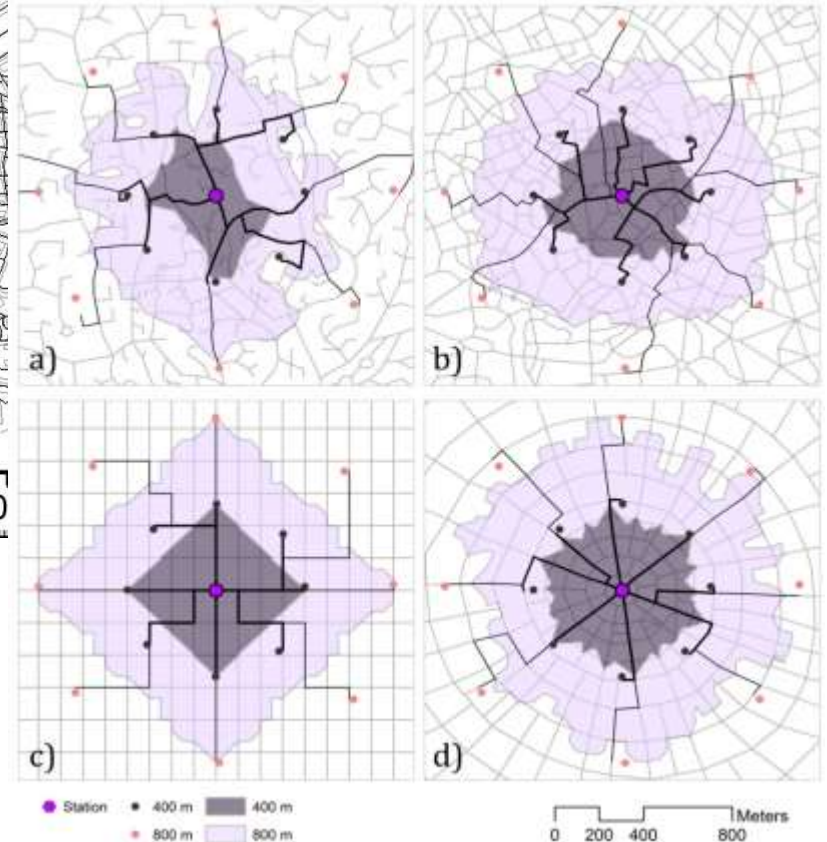
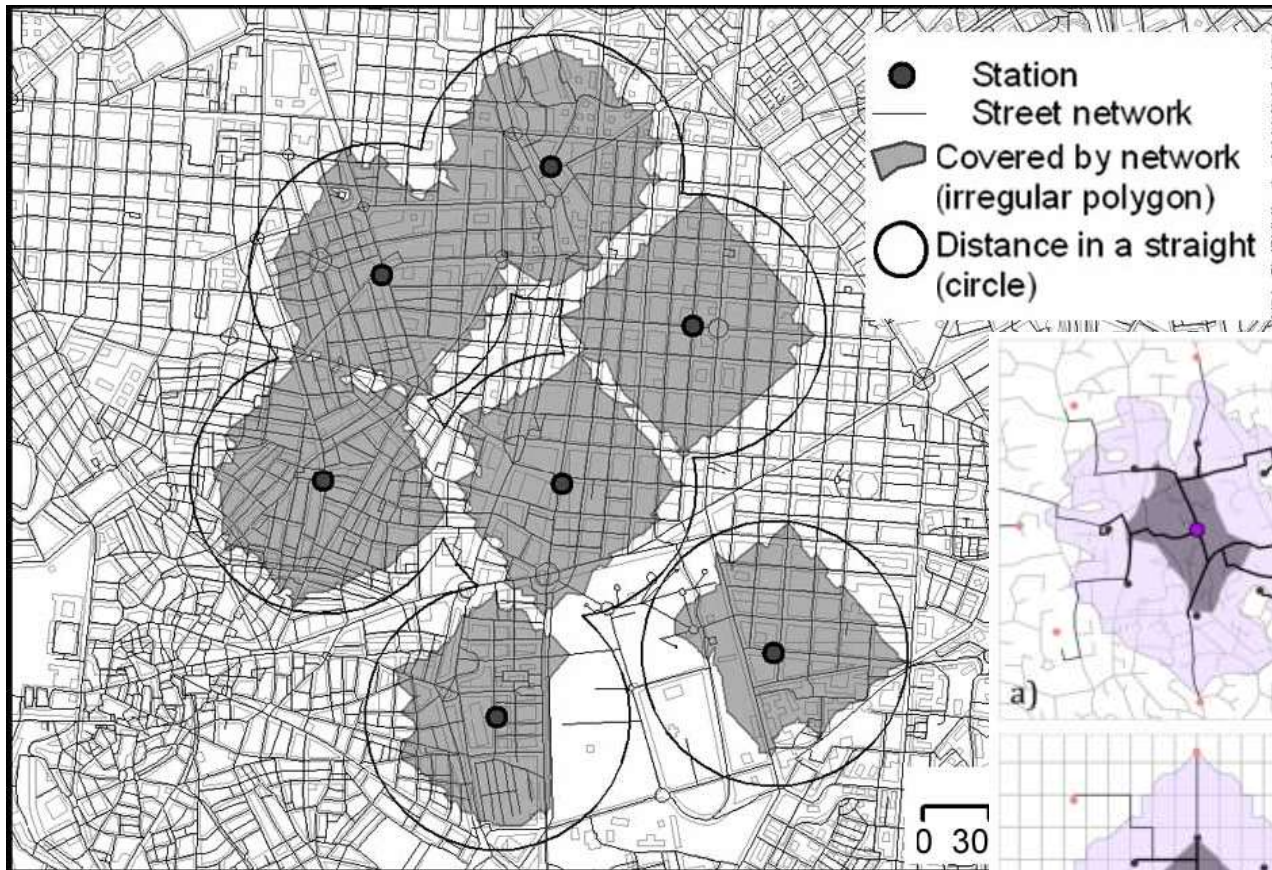


Localization of Cholera



Transport





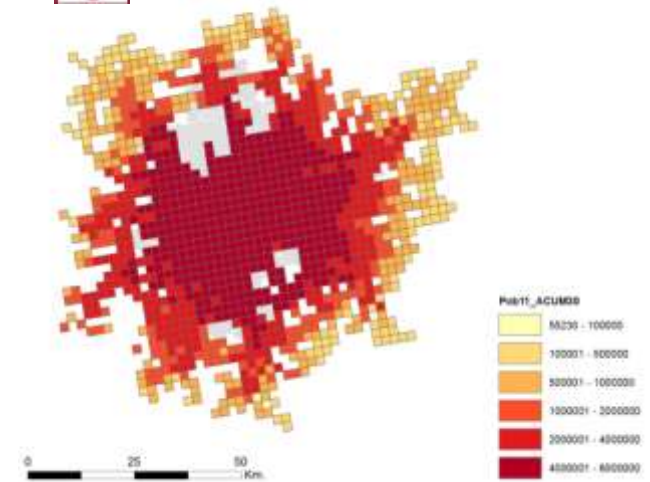
*Analysing proximity to public transport:
the role of street network design*



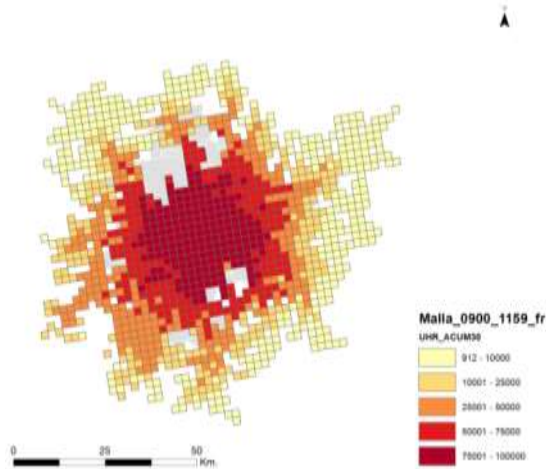
Accessibility static vs dynamic – available opportunities (population within 30 min)



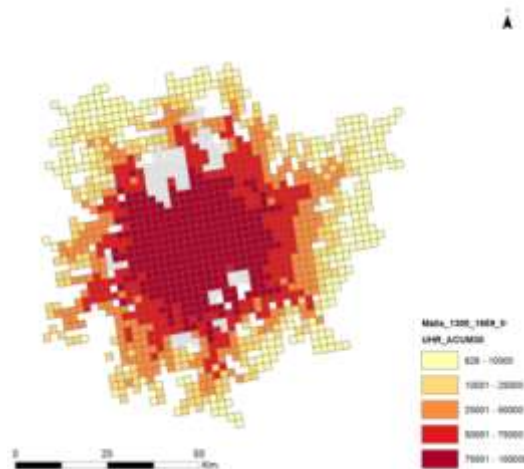
Population



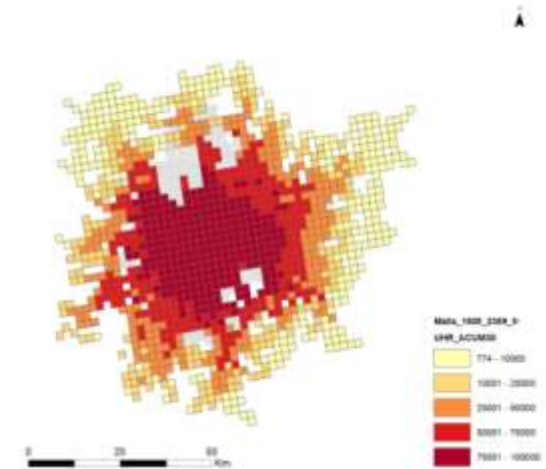
Morning
(09:00 – 11:59)



Afternoon
(13:00 – 16:59)

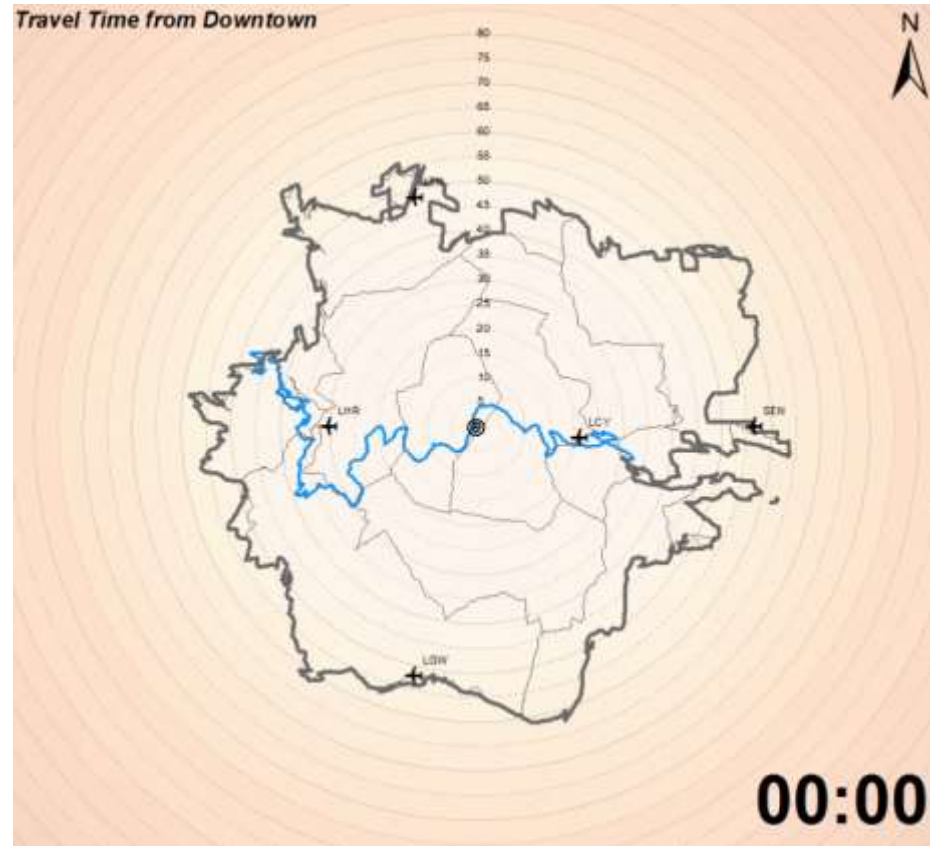
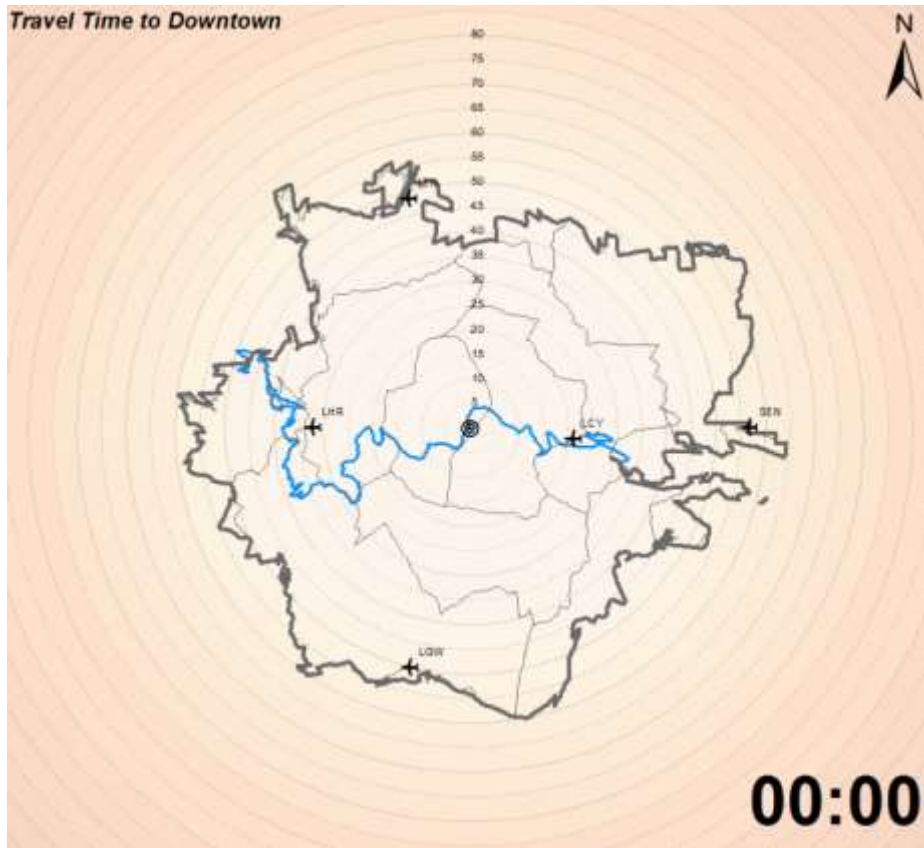


Night
(18:00 – 23:59)



The impact of congestion in accessibility

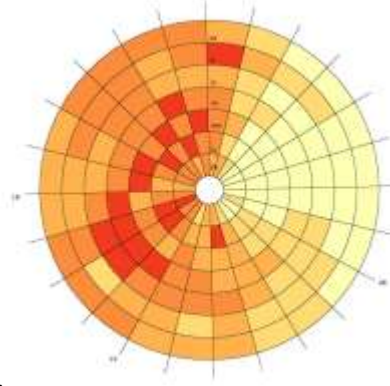
Work in progress





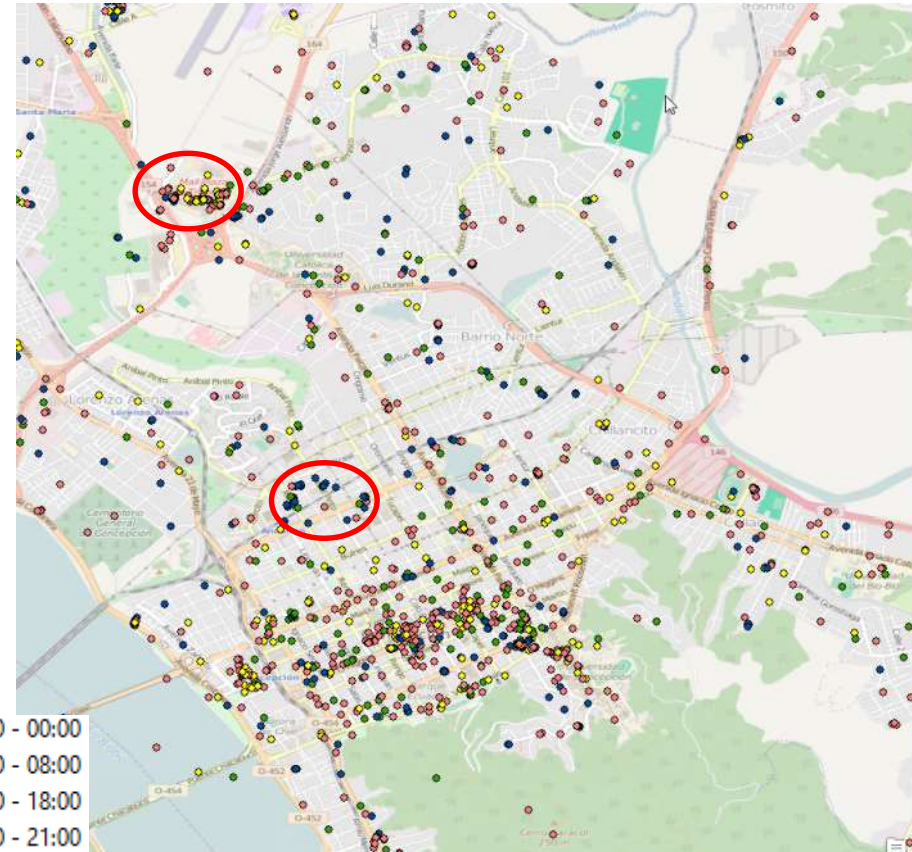
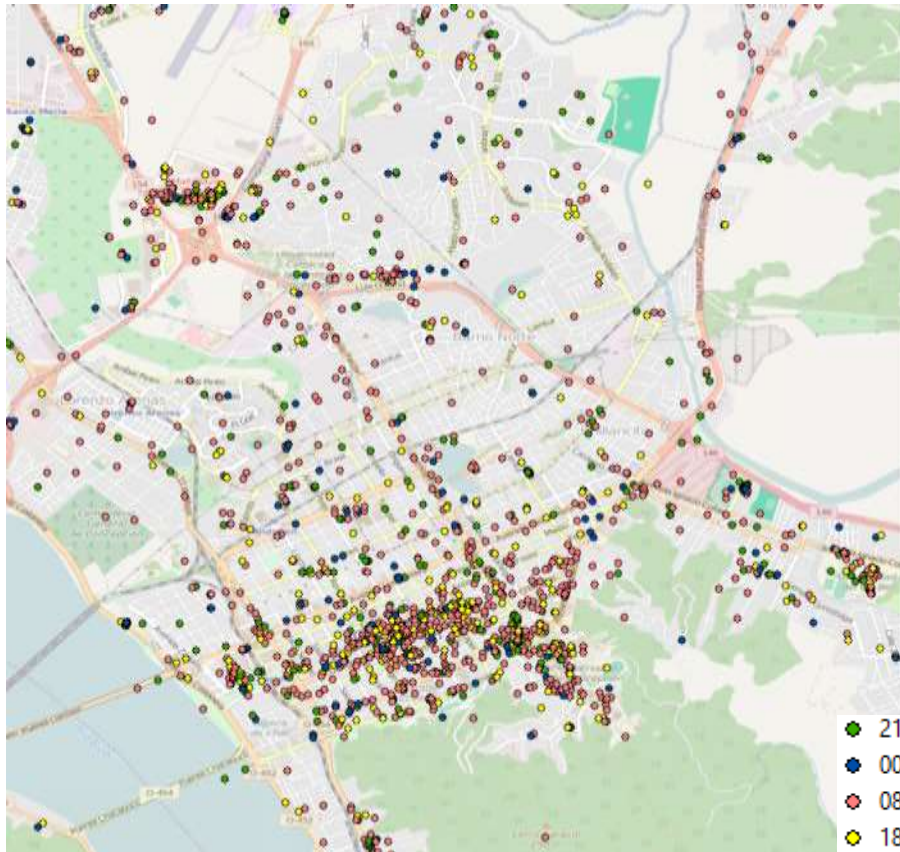
The screenshot shows the 'Breathe Better' web application interface. The browser address bar displays <https://urbandatafest.mybluemix.net>. The application header includes the 'Breathe Better' logo and a navigation menu. The main content area features a map of Madrid with a green circular route highlighted. A legend in the top right corner indicates Nitrogen Dioxide (N₂) levels in µg/m³, with categories: Good (0-100), Admissible (101-200), Deficient (201-300), and Bad (>301). A current reading shows N₂: 0.3 µg/m³. The left sidebar contains a 'MENU' section with 'ROUTE' and 'CIRCULAR' options. Below this, there is a text-based explanation of the circular route feature, a length input field set to 6 km, and a 'LETS GO!' button. The bottom of the interface shows a video player for 'Breathe Better' and a 'datos abiertos' (open data) section.

<http://www.global.datafest.net/projects/breathe-better>

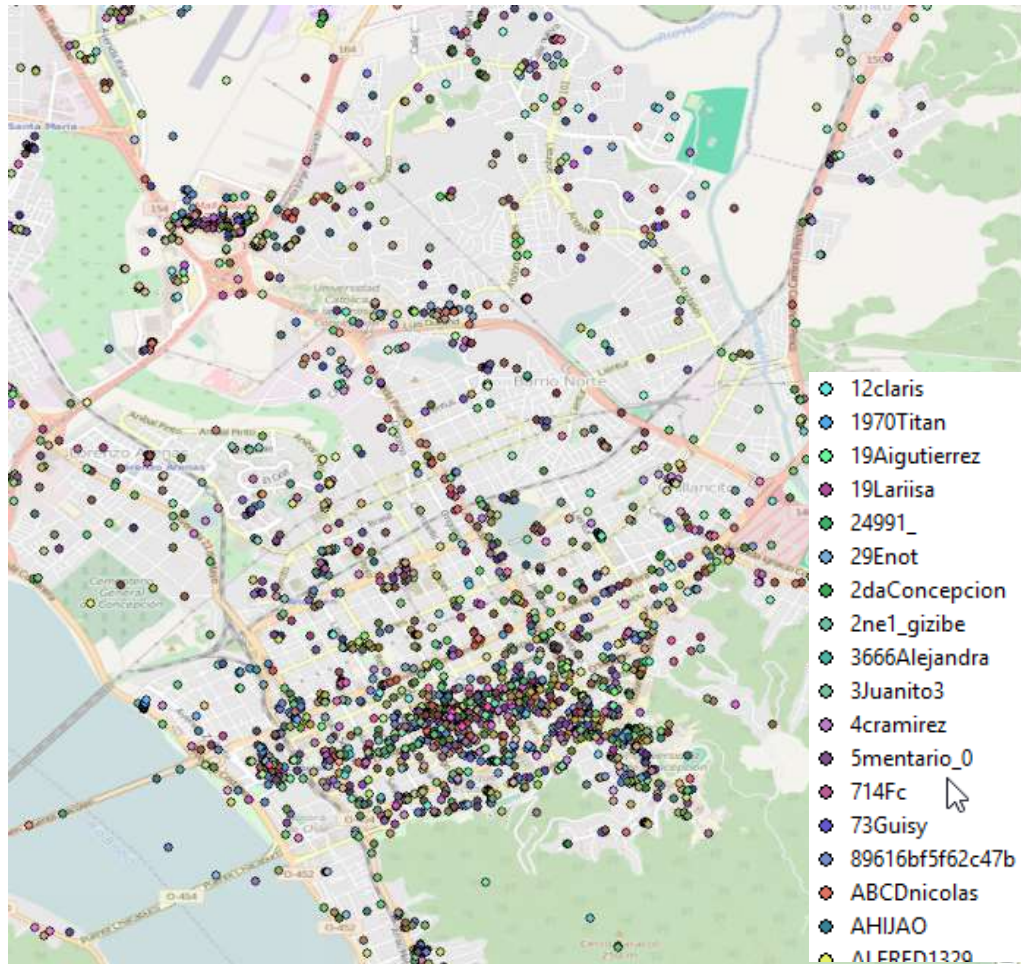


Tweets de lunes a jueves por franja horaria

Tweets en fin de semana por franja horaria



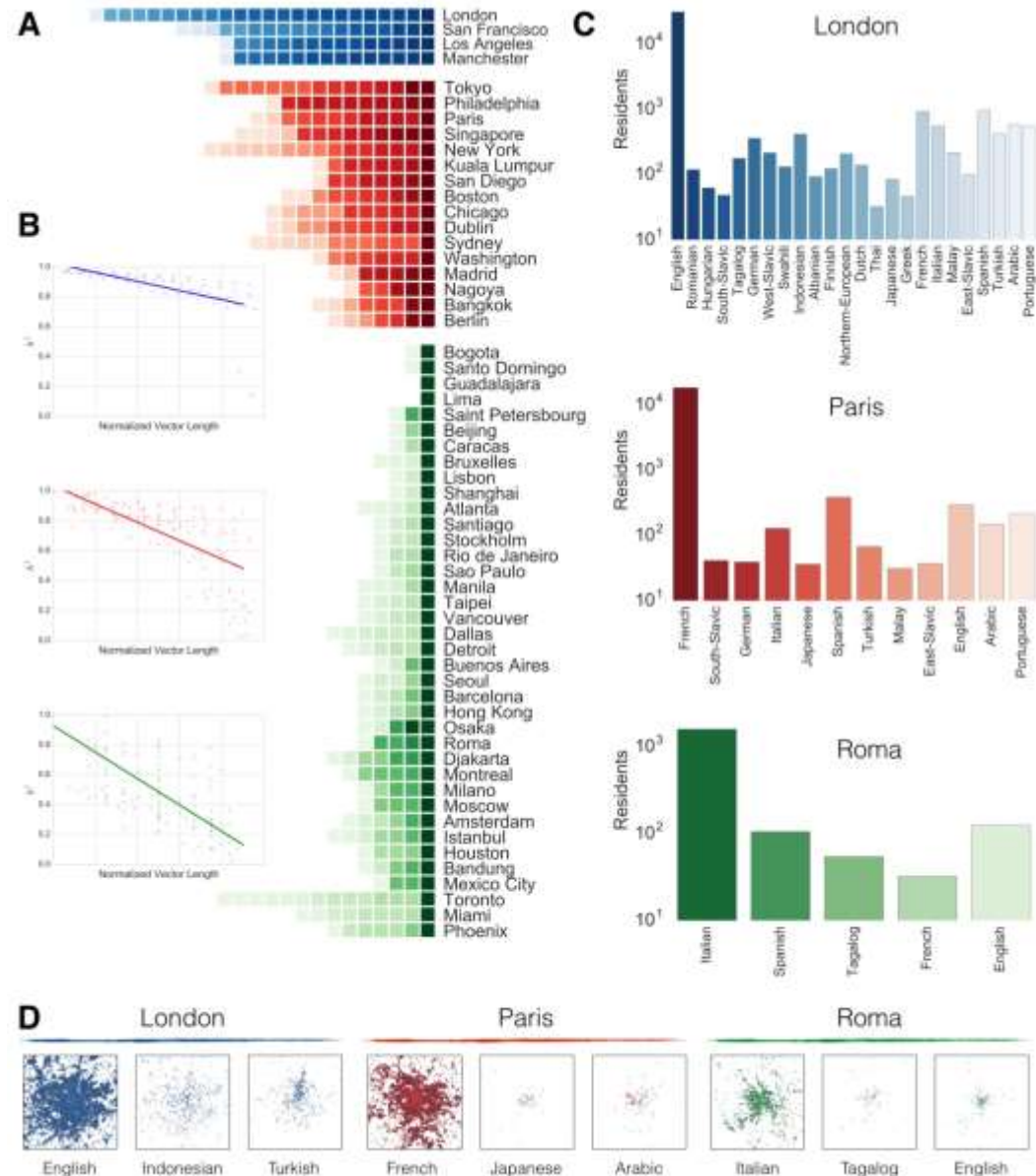
Usuarios



Integration Patterns of International Communities in Cities

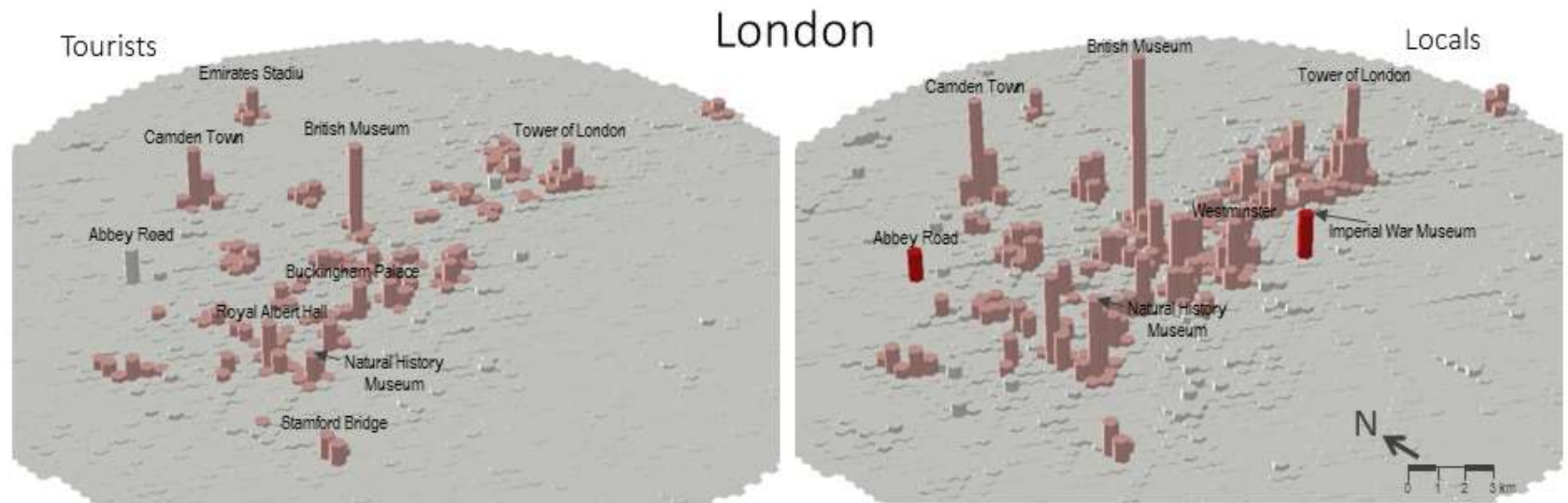


Power of Integration. Three groups of cities show similar behaviour in the number of languages detected, in their level of integration and in their relative ranges (A), as shown in the normalized decay of their respective sorted values of entropy (B). The *Integration Skyline* diagram (C) let comprehend the distribution of each community in function of the number of resident users detected in each city and their respective entropy (i.e the color of the bars in descending order). It may occur that small communities (in terms of users) show higher level of integration than others represented by higher number of detected residents. A schematic spatial distribution of people is highlighted, related to the three languages (D), plotted over a radius of 30 km measured from the barycenter of the city.

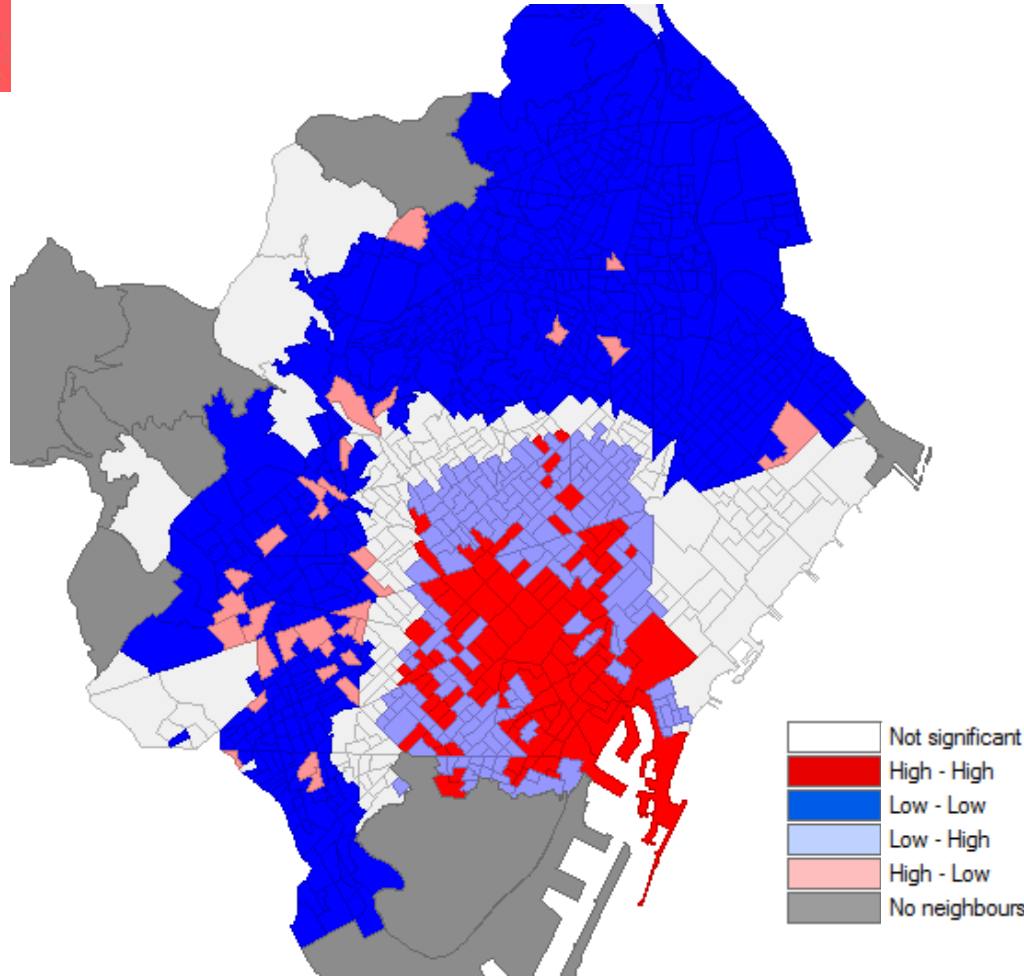


Identification of tourist hot spots based on social networks: A comparative analysis of European metropolises using photo-sharing services and GIS

Panoramio



Regular accommodation vs. Airbnb



Bivariate Anselin Local Moran's I statistic (LISA)

Javier Gutiérrez, Juan Carlos García, María Henar Salas-Olmedo, Gustavo Romanillos. *Airbnb irruption in heritage cities: towards the collapse of historical centres?*

MULTA DEL AYUNTAMIENTO DE COLAU

Airbnb: "Barcelona es la única ciudad del mundo que nos ha multado"

Colau sanciona a la plataforma con 600.000 euros por anunciar pisos turísticos ilegales



CLARA BLANCAHAR

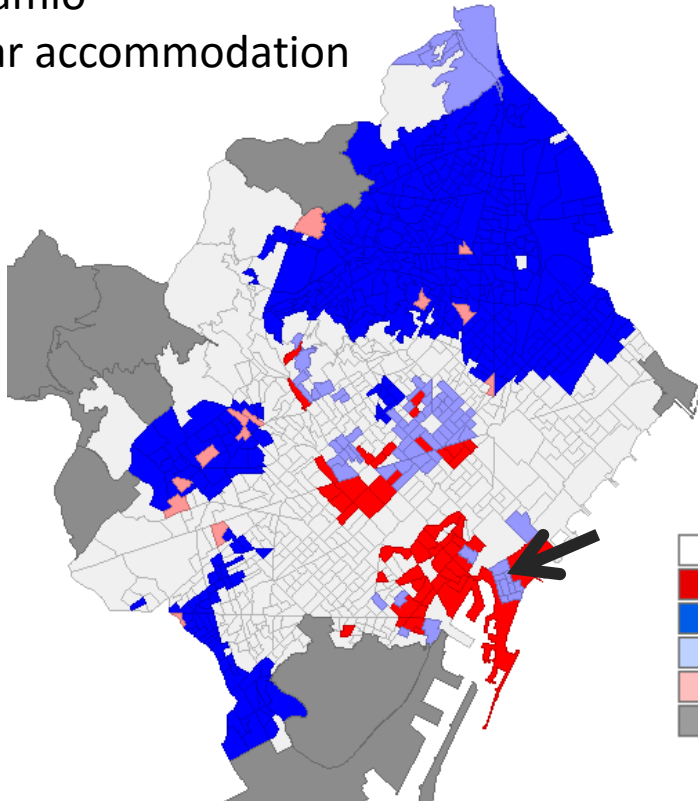
Barcelona • 24/05/2018 • 17:04:03



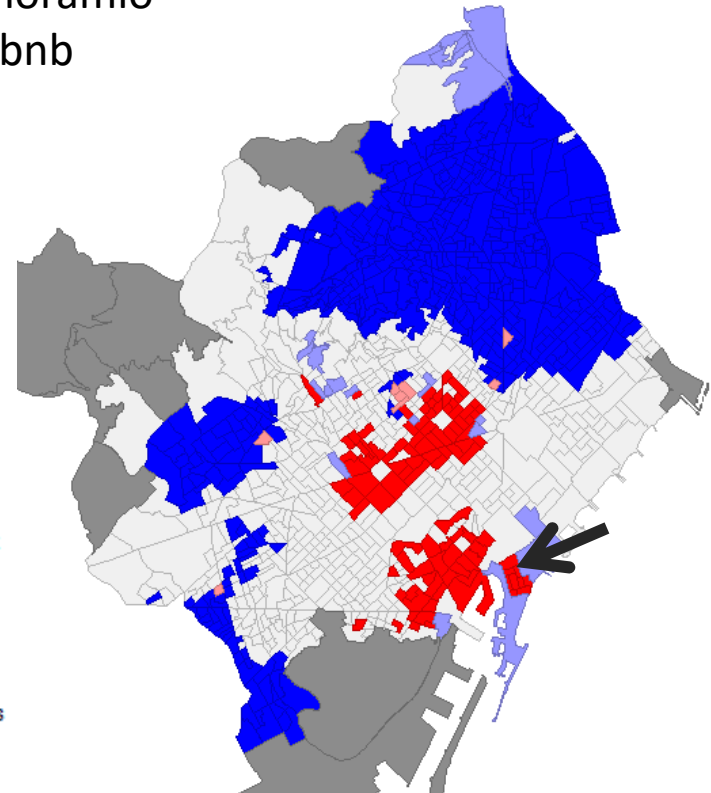
LA alcaldesa de Barcelona, Ada Colau, en una imagen de un tuit de RFEF



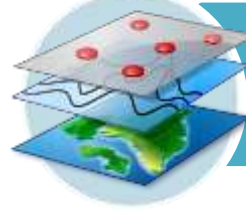
Panoramio –
Regular accommodation



Panoramio –
Airbnb



Bivariate Anselin Local Moran's I statistic (LISA)



Software



MapInfo.

idrisi



Open source



Quantum GIS (QGIS)



GRASS GIS

The world's leading Free GIS software





gySIG 1.10:Sanejament.gvp

Archivo Capa Ver Vista Red Tabla Ventana SWMM Ayuda

Subcatchment

Vista : Sanejament a Poble nou

Tabla: Tabla de atributos: junction.shp

OBJECTID	ID_Junct	cota_terr	Invertel	maxdepth	xcoord	ycoord
1	0100097	164.68	163.15	1.53	427687.0	4601890.0
2	0100001	162.44	159.89	2.55	427664.0	4601880.0
3	0100002	154.14	152.16	1.98	427623.0	4601880.0
4	0100003	154.19	152.43	1.76	427628.0	4601870.0
5	0100004	153.98	152.22	1.76	427626.0	4601870.0
6	0100005	153.97	151.55	2.42	427641.0	4601800.0
7	0100006	153.47	151.16	2.31	427649.0	4601750.0
8	0100009	153.38	151.36	2.02	427644.0	4601740.0
9	0100010	154.05	152.28	1.77	427616.0	4601750.0
10	0100096	159.39	154.49	4.9	427572.0	4601750.0
11	0100083	159.91	155.07	4.84	427556.0	4601750.0
12	0100095	159.72	155.0	4.72	427559.0	4601750.0
13	0100094	160.4	156.55	3.85	427548.0	4601760.0
14	0100093	160.48	157.08	3.4	427547.0	4601770.0
15	0100092	161.07	158.1	2.97	427533.0	4601770.0
16	0100091	163.51	160.41	3.1	427519.0	4601750.0
17	0100090	166.57	162.96	3.61	427499.0	4601720.0
18	0100030	166.63	164.93	1.7	427505.0	4601710.0
19	0100089	169.02	165.77	3.25	427478.0	4601710.0
20	0100088	171.64	167.82	3.82	427453.0	4601690.0
21	0100087	174.11	170.7	3.41	427429.0	4601690.0
22	0100086	176.43	173.19	3.24	427401.0	4601680.0
23	0100032	179.74	176.81	2.93	427374.0	4601650.0
24	0100031	180.34	176.17	4.17	427361.0	4601660.0
25	0100078	176.36	173.77	2.59	427418.0	4601640.0
26	0100026	168.08	165.8	2.28	427517.0	4601680.0
27	0100025	162.23	159.35	2.88	427566.0	4601700.0
28	0100011	155.26	153.17	2.09	427609.0	4601720.0
29	0100007	152.75	151.09	1.66	427652.0	4601730.0
30	0100008	152.75	150.88	1.87	427652.0	4601730.0
31	0100014	155.88	154.29	1.59	427655.0	4601690.0
32	0100012	160.04	157.14	2.9	427610.0	4601700.0
33	0100013	163.17	160.32	2.85	427611.0	4601680.0
34	0100034	184.09	180.4	3.69	427324.0	4601660.0
35	0100035	188.58	184.64	3.94	427286.0	4601660.0
36	0100036	192.0	188.6	3.4	427253.0	4601660.0
37	0100101	191.75	190.45	1.3	427253.0	4601650.0
38	0100076	197.05	194.12	2.93	427209.0	4601650.0
39	0100075	199.12	197.08	2.04	427190.0	4601640.0
40	0100074	200.29	198.14	2.15	427212.0	4601610.0
41	0100073	199.91	197.8	2.11	427227.0	4601570.0
42	0100037	190.31	189.0	1.31	427269.0	4601600.0
43	0100038	186.31	183.38	1.93	427316.0	4601630.0

4 / 110 Total registros seleccionados.



Quantum GIS (QGIS)



GRASS GIS
The world's leading Free GIS software

The screenshot shows the QGIS 0.8.0 interface. The main map displays a satellite view of a residential area with buildings colored according to their type. The legend on the left lists the following categories:

- Baracca
- Capannone
- Edificio
- Edificio a portico
- Edificio a stallo
- Edificio interrato
- Fabbricato di culto
- Silo, contenitore, cisterna
- Tettoia o pensilina
- OrthoM_edifici3D

The GRASS Tools dialog box is open, showing the 'pa/attributoenergy' tool. The attribute table for the 'Edificio_1' layer is displayed below the tool options:

	tipo_label	z	tipc	tipogr	area_int	perim_int
1083	2.02.01	11.500000	Edificio	Building	37	25
1084	2.02.01	6.200000	Edificio	Building	874	116
1085	2.02.01	13.100000	Edificio	Building	717	186
1086	2.02.01	18.990000	Edificio	Building	113	86
1087	2.02.01	16.710000	Edificio	Building	232	61
1088	2.02.01	8.680000	Edificio	Building	73	31
1089	2.02.01	14.090000	Edificio	Building	116	47
1090	2.02.01	2.580000	Edificio	Building	52	32
1091	2.02.01	6.080000	Edificio	Building	303	60

The interface also shows a 'GRASS Tools: pa/attributoenergy' dialog box with various tool options like 'Voronoi diagram (lines)', 'Network analysis', and 'Layers'. The status bar at the bottom indicates a scale of 1:825 and a coordinate system of 1664139.5103209.



CartoDB™ 2015

Maps your world's data

We are excited to welcome **Nutiteq** — pioneers in native mobile mapping. [Please read more.](#)

PRODUCT - SOLUTIONS - DISCOVER - LEARN - PRICING LOGIN SIGN UP

MAP YOUR WORLD'S DATA

CartoDB is the Easiest Way to Map and Analyze Your Location Data

SIGN UP



MapInfo

MapInfo Professional

File Edit Tools Objects Query Table Options Map Window Help

Layer Control

Buildings,DCDB,....DTM_ZCOORD Map

- Cosmetic Layer
- Property
 - Buildings
 - DCDB
 - Driveway
 - Easements
 - RoadCasements
 - RoadLine
 - RoadCrown
 - RoadEdgeOfGravel
 - RoadFootpath
 - RoadKerb
- Assets
 - SewerGravityMains
 - DrainageInletPits
 - DrainageInlets/Outlets
 - DrainageManholes
 - DrainagePipes
 - Driveway
- Regions
 - DCDB
 - RoadLine
 - RoadEdgeOfRunen
 - RoadEdgeOfGravel
 - RoadKerb
 - RoadSigns
- Drains
 - RoadLineMarking
 - RoadSigns
 - RoadFootpaths
 - RoadCrown
 - RoadKerb
 - Easements
 - WaterValves
 - WaterTees_Crosses
 - WaterHydrants
 - WaterMains
 - SewerPumpStations

Updated 1 layer

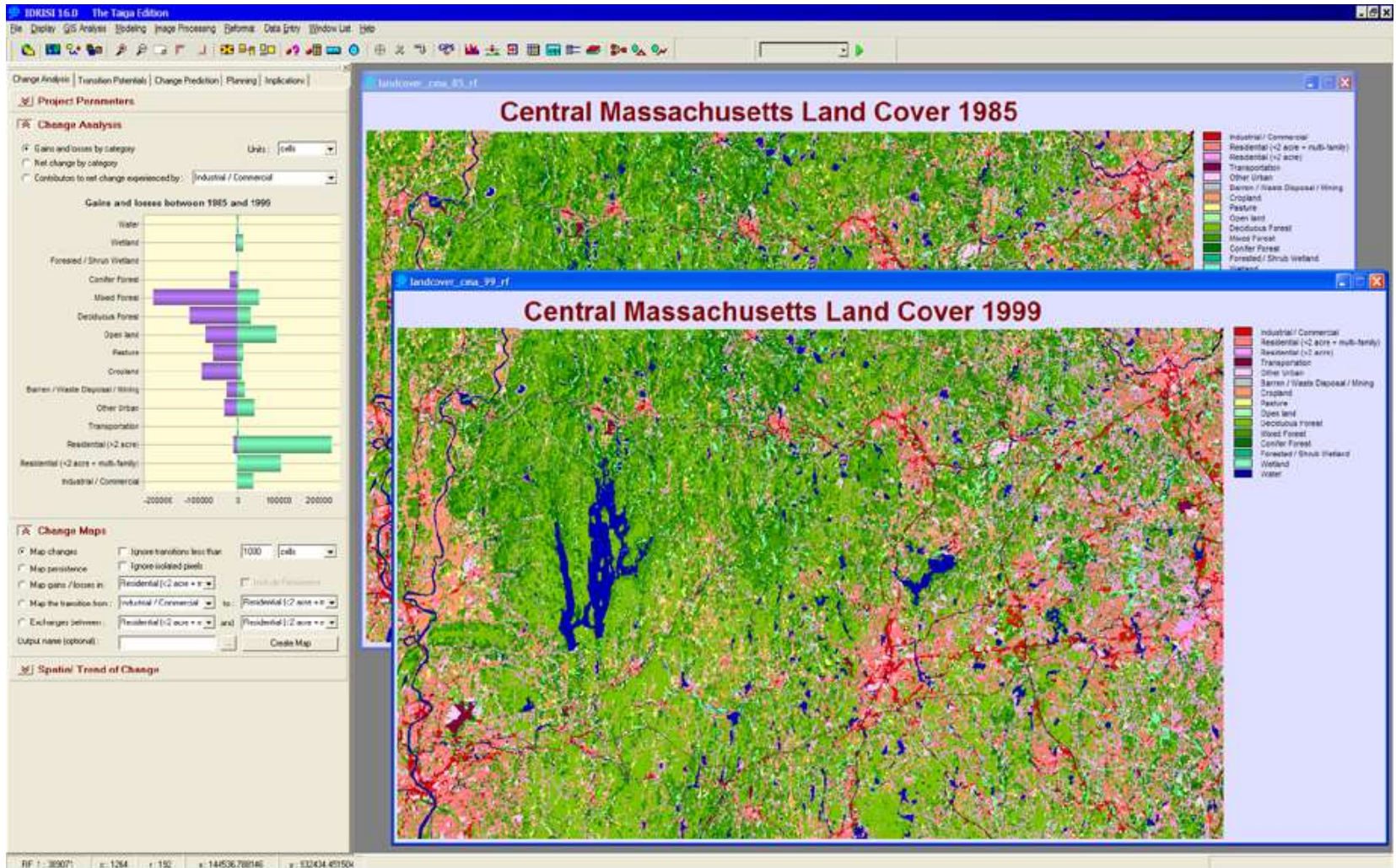
Zoom: 446.2 m Editing: Buildings Selecting: DCDB SNAP

Buildings,DCDB,....DTM_ZCOORD Map

0 150.0 meters
Scale: 1:1,181

Query1 Browser

house_add	Lotplan	plan	tenure	parish	Name	Alias_name	lot	area	reserve	surveyed	status
82-83 Esplanade	3RP94421	RP94421	Freehold	Vernon			3	1,037		surveyed	Lots
14 Flinders St	4RP130680	RP130680	Freehold	Vernon			4	771		surveyed	Lots
64 Helsham St	4RP76467	RP76467	Freehold	Vernon			4	506		surveyed	Lots
8 Flinders St	5RP120453	RP120453	Freehold	Vernon			5	607		surveyed	Lots
80 Corfield St	6RP103821	RP103821	Freehold	Vernon			6	2,039		surveyed	Lots
25 Aplin St	12PV16014	PV16014	Freehold	Vernon			12	1,017		surveyed	Lots
90 Corfield St	14RP108235	RP108235	Freehold	Vernon			14	956		surveyed	Lots
17 Aplin St	15PV16016	PV16016	Freehold	Vernon			15	1,017		surveyed	Lots
84 Corfield St	17RP108235	RP108235	Freehold	Vernon			17	1,386		surveyed	Lots
2 Patanava La	1RP144335	RP144335	Freehold	Vernon			1	810		surveyed	Lots
70 Blouville St	12RP108235	RP108235	Freehold	Vernon			4	784		surveyed	Lots



Find (and Make!) the Maps You Love



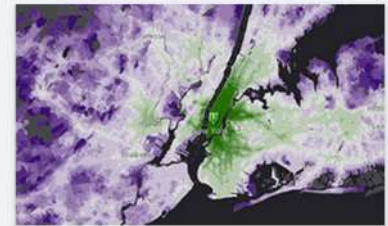
When the Skies
Turned Dark



Breweries of the
World



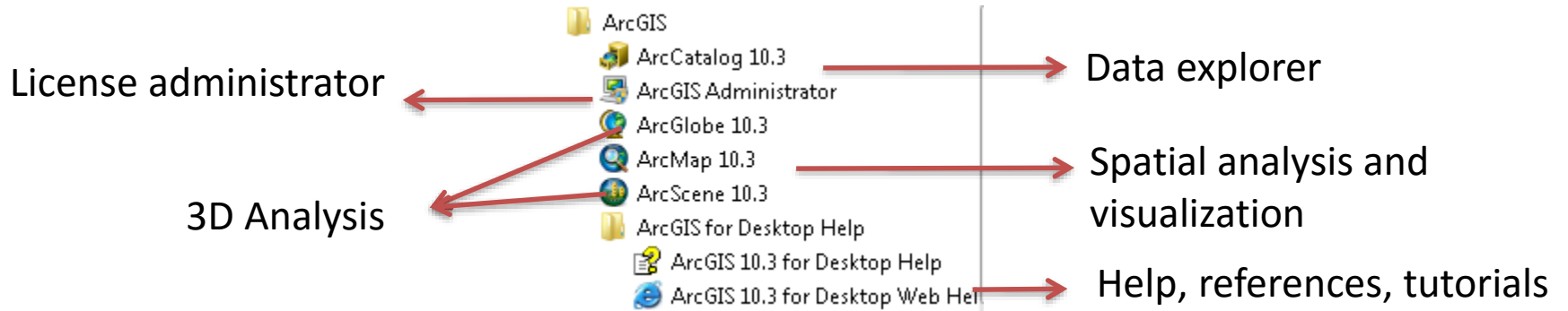
National Maps for
Switzerland



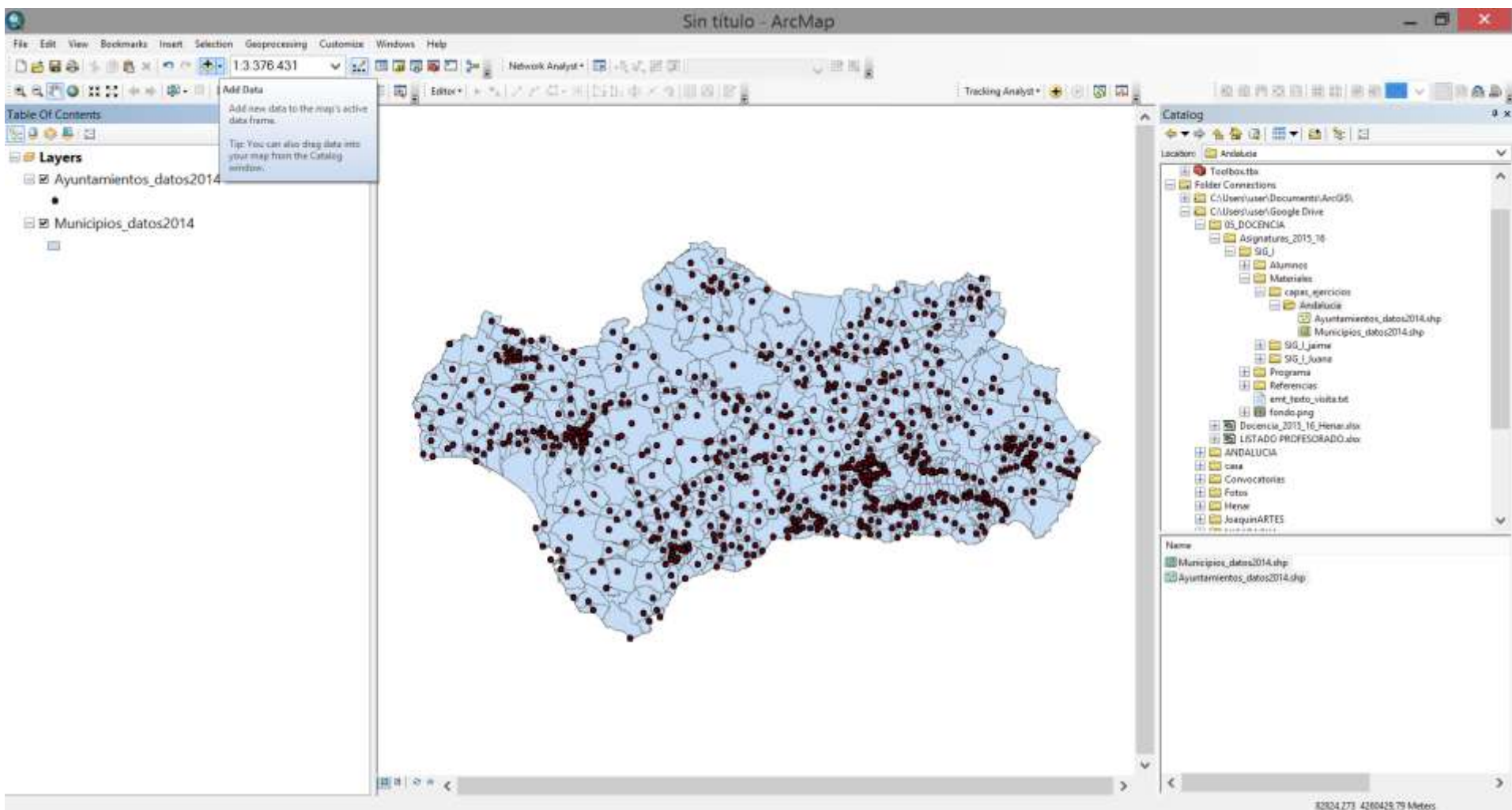
Job Accessibility



ArcGIS



ArcGIS – add data



ArcGIS – attribute table

The screenshot displays the ArcGIS interface with the following components:

- Table of Contents:** Shows the layer 'EU_country_ETRS89_LCC' selected.
- Table:** Displays the attribute table for 'EU_country_ETRS89_LCC_EUROSTAT_2012'. The table has 6 columns: FID, Shape *, OBJECTID, CNTR_ID, SHAPE_Leng, and SHAPE_Area. Row 12 (Spain) is selected.
- Map:** Shows a map of Europe with the selected country (Spain) highlighted in cyan.
- Catalog:** Shows the file structure, including the selected file 'EU_country_ETRS89_LCC_EUROSTAT_2012.shp'.

FID	Shape *	OBJECTID	CNTR_ID	SHAPE_Leng	SHAPE_Area
10	Polygon	62	EE	29.320417	7.021361
11	Polygon	65	EL	109.400349	13.769603
12	Polygon	67	ES	68.206516	53.595682
13	Polygon	69	FI	119.591786	62.998403
14	Polygon	73	FO	11.193939	0.239692
15	Polygon	74	FR	92.552285	71.754389
16	Polygon	78	GG	0.677488	0.008932
17	Polygon	93	HR	54.854143	6.452765
18	Polygon	95	HU	20.157361	11.036369
19	Polygon	97	IE	47.363119	9.404627
20	Polygon	99	IM	1.382188	0.078978

5737008.957 1549671.817 Meters

ArcGIS –toolboxes

The screenshot displays the ArcGIS desktop environment. The main map area shows a map of Europe with a green polygon highlighting a region. Overlaid on the map is the 'Dissolve' tool dialog box. The dialog box is configured with the following settings:

- Input Features:** EU_country_ETRS89_LCC_EUROSTAT_2012
- Output Feature Class:** C:\Users\Projects\XP\Documents\koo\GIS\pelaut\gd\EU_country_ETRS89_LCC_EUROSTA
- Dissolve Fields (optional):** FID, OBJECTID, CNTR_ID, SHAPE_Leng, SHAPE_Area
- Statistics Field(s) (optional):** SHAPE_Area, with a statistic type of SUM.

The dialog box also includes a visual representation of the 'Dissolve' process, showing an 'INPUT' map with several colored polygons and an 'OUTPUT' map where these polygons have been merged into a single larger shape.

In the background, a 'Table Of Contents' window displays a table with the following data:

FID	Shape *	OBJECTID	CNTR_ID	SHAPE_Leng	SHAPE_Area
10	Polygon	62	EE	29.320417	7.021361
11	Polygon	65	EL	109.400349	13.769603
12	Polygon	67	ES	68.206516	53.595682

The 'ArcToolbox' window is open on the right side of the interface, showing a search for the 'Dissolve' tool. The search results list several 'Dissolve' tools, including:

- Dissolve (Coverage) (Tool)**: Creates a new coverage by m...
- Dissolve (Data Managem...**: Aggregates features based on...
- Dissolve Network (Networ...**: Creates a network dataset th...
- Dissolve Route Events (Lin...**: Removes redundant informati...
- Unsplit Line (Data Manage...**: Merges lines that have coincid...
- Eliminate (Data Managem...**: Eliminates polygons by mergi...
- Multiple Ring Buffer (Analysi...**: Creates multiple buffers at sp...

ArcGIS - extensions

Sin título - ArcMap

File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

Table Of Contents Table

Layers

EU_country_ETRS89_LCC_EUROSTAT

FID	Shape *	OBJECTID	
10	Polygon	62	EU
11	Polygon	65	EU
12	Polygon	67	EU
13	Polygon	69	FI
14	Polygon	73	FO
15	Polygon	74	FR
16	Polygon	78	GG
17	Polygon	93	HR
18	Polygon	95	HU
19	Polygon	97	IE
20	Polygon	99	IM

EU_country_ETRS89_LCC_EUROSTAT_2012

(1 out of 42 Selected)

EU_country_ETRS89_LCC_EUROSTAT_2012

Drawing

- 3D Analyst
- Advanced Editing
- Animation
- ArcScan
- COGO
- Data Driven Pages
- Data Frame Tools
- Distributed Geodatabase
- Draw
- Edit Vertices
- Editor
- Effects
- Feature Cache
- Feature Construction
- Geocoding
- Geodatabase History
- Geometric Network Editing
- Georeferencing
- Geostatistical Analyst
- GPS
- Graphics
- Image Classification
- Labeling
- LAS Dataset
- Layout
- Network Analyst
- OpenStreetMap
- Parcel Editor
- Publisher
- Raster Painting
- Representation
- Route Editing
- Schematic

Customize Windows Help

Toolbars

Extensions...

Add-In Manager...

VBA Macros

Customize Mode...

Style Manager...

ArcMap Options...

Extensions

Select the ArcGIS Desktop extensions you want to use. Extensions provide extended capabilities and usually require that you have a license to use them. The dialog lists the extensions that are currently installed on your system and which work with the application you are currently using.

Extensions

Select the extensions you want to use.

- 3D Analyst
- ArcScan
- Data Interoperability
- Geostatistical Analyst
- Network Analyst
- Publisher
- Schematics
- Spatial Analyst
- Tracking Analyst

Description:

3D Analyst 10.2
Copyright ©1999-2013 Esri Inc. All Rights Reserved

Provides tools for surface modeling and 3D visualization.

Close

ArcGIS – monitoring the outcomes

The screenshot displays the ArcGIS desktop environment. The main window shows a map of Europe with a highlighted region in Spain. A geoprocessing tool menu is open, listing various tools such as Buffer, Clip, Intersect, Union, Merge, Dissolve, Search For Tools, ArcToolbox, Environments..., and Results. The Results tool is selected, and a tooltip explains its function: "Open the Results window so you can track and review the geoprocessing steps you have performed. In this window you can also share your geoprocessing results with others as packages or services. Press F1 for more help."

The Table of Contents shows two layers: EU_country_ETRS89_LC and EU_country_ETRS89_LC. The Table window displays the following data:

FID	Shape	eng	SHAPE_Area
10	Polygon	0417	7.021361
11	Polygon	0349	13.769603
12	Polygon	8516	53.595682
13	Polygon	786	62.998403
14	Polygon	8939	0.239692
15	Polygon	2285	71.754389
16	Polygon	7488	0.008932
17	Polygon	452765	
18	Polygon	036369	
19	Polygon	404627	
20	Polygon	078978	

The ArcToolbox is open, showing a list of tool categories including Analysis Tools, Cartography Tools, Conversion Tools, Data Interoperability Tools, Data Management Tools, Archiving, Attachments, Data Comparison, Distributed Geodatabase, Domains, Feature Class, Features, Fields, File Geodatabase, General, Generalization, Geodatabase Administration, Geometric Network, Graph, Indexes, Joins, LAS Dataset, Layers and Table Views, Package, Photos, Projections and Transformations, Raster, Relationship Classes, Subtypes, Table, and Tile Cache.

The Results window shows a tree view of the current session, including a Dissolve tool and its output feature class: EU_country_... The Shared folder is also visible.

The status bar at the bottom indicates the drawing scale: 2694482.025 2072054.631 Meters.

ArcGIS - help

Dissolve (Data Management)

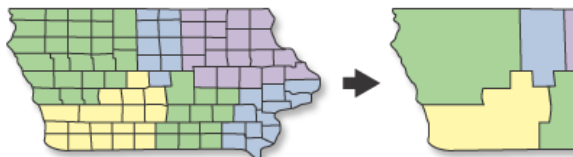
License Level: Basic Standard Advanced

Summary

Aggregates features based on specified attributes.

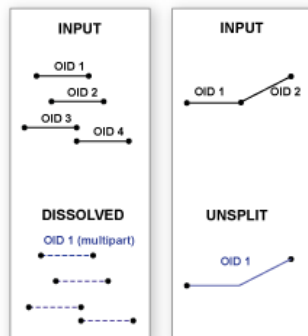
[Learn more about how Dissolve works](#)

Illustration



INPUT

OUTPUT



Usage

- The attributes of the features that become aggregated are summarized or described using a variety of statistics. The summarize attributes is added to the output feature class using the following naming standard of statistic type + underscore + name. For example, if the SUM statistic is used on a field named POP, the output will have a field named SUM_POP.
- Dissolve can create very large features in the output feature class, especially true when there is a small number of unique values in the dissolve field.

Syntax

```
Dissolve_management (in_features, out_feature_class, {  
{statistics_fields}, {multi_part}, {unsplit_lines})
```

Parameter	Explanation
in_features	The features to be aggregated.
out_feature_class	The feature class to be created that will contain the aggregated features.
dissolve_field [dissolve_field,...] (Optional)	The field or fields on which to aggregate features. The Add Field button, which is used in the Model Builder, allows you to add fields so you can complete the dialog and continue to build your model.
statistics_fields [[field, {statistic_type}],...] (Optional)	The fields and statistics with which to summarize attributes. Text attributes may be summarized using the statistics FIRST or LAST. Numeric attributes may be summarized using any statistic type except null. The following list of statistics is excluded from all statistical calculations: <ul style="list-style-type: none">FIRST—Finds the first record in the specified field and uses its specific value.LAST—Finds the last record in the specified field and uses its specific value.SUM—Adds the total value for the specified field.MEAN—Calculates the average value for the specified field.MIN—Finds the smallest value of the records of the specified field.MAX—Finds the largest value of the records of the specified field.RANGE—Finds the range of values (MAX-MIN) for the specified field.STD—Finds the standard deviation of the values in the specified field.COUNT—Finds the number of records included in statistical calculations. The COUNT statistic counts each value except null values. If the field is null, the COUNT statistic determines the number of null values. If the field is not null, the COUNT statistic determines the number of unique values in the specified field.
multi_part (Optional)	Specifies whether multipart features are allowed in the output feature class. <ul style="list-style-type: none">MULTI_PART—Specifies that multipart features are allowed. This is the default.

Code Sample

Dissolve example 1 (Python window)

The following Python window script demonstrates how to use the Dissolve_management tool in immediate mode.

```
import arcpy  
from arcpy import env  
env.workspace = "C:/data/Portland.gdb/Taxlots"  
arcpy.Dissolve_management("taxlots", "C:/output/output.gdb/taxlots_dissolved",  
["LANDUSE", "TAXCODE"], "", "SINGLE_PART", "DISSOLVE_LINES")
```

Dissolve example 2 (stand-alone script)

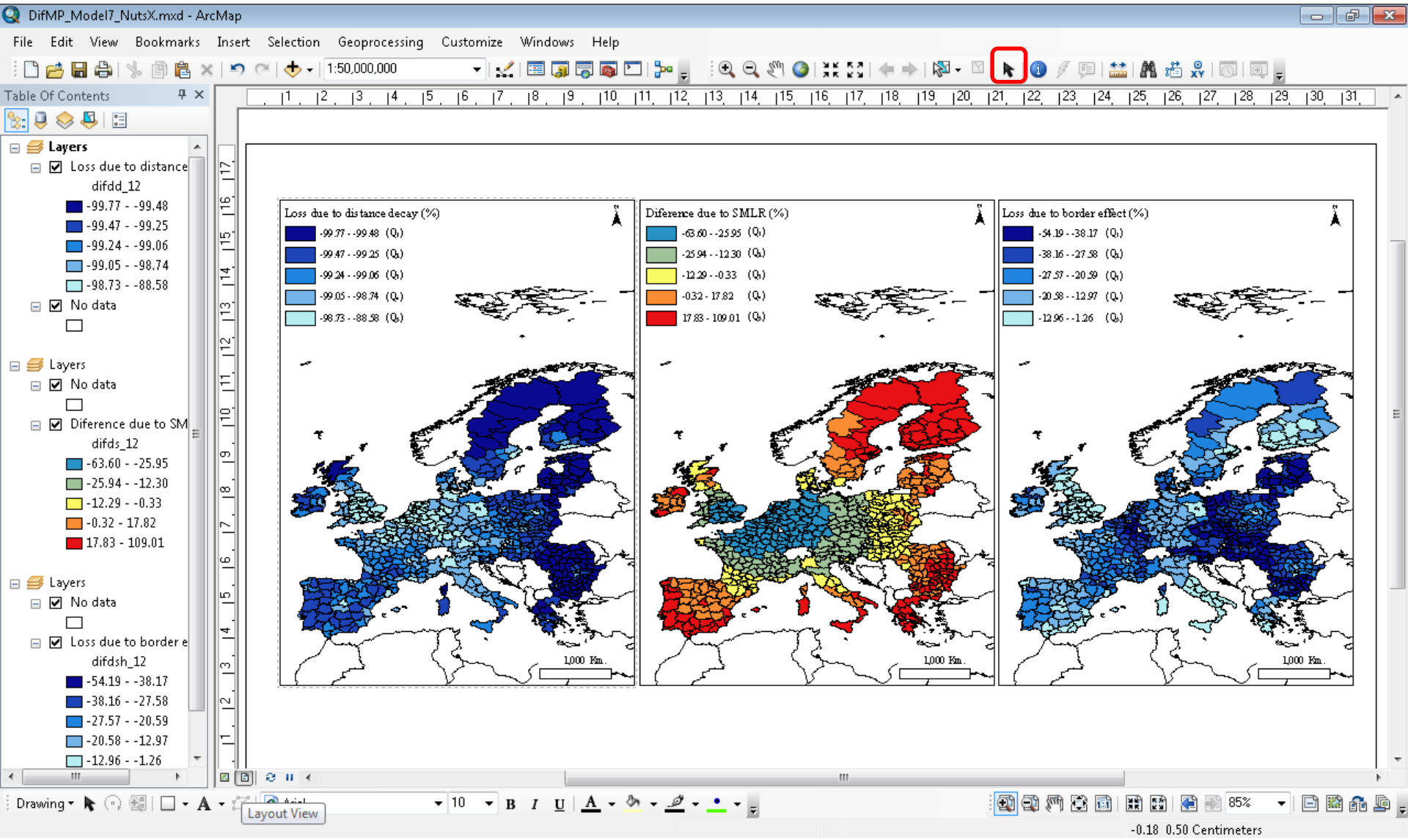
The following stand-alone script demonstrates how to use the Dissolve_management tool.

```
# Name: Dissolve_Example2.py  
# Description: Dissolve features based on common attributes  
  
# Import system modules  
import arcpy  
from arcpy import env  
  
# Set environment settings  
env.workspace = "C:/data/Portland.gdb/Taxlots"  
  
# Set local variables  
inFeatures = "taxlots"  
tempLayer = "taxlotsLyr"  
expression = arcpy.AddFieldDelimiters(inFeatures, "LANDUSE", "TAXCODE",  
outFeatureClass = "C:/output/output.gdb/taxlots_dissolved"  
dissolveFields = ["LANDUSE", "TAXCODE"]  
  
# Execute MakeFeatureLayer and SelectLayerByAttribute. This will create a  
# temporary layer that contains only the features that are not desired in the output.  
arcpy.MakeFeatureLayer_management(inFeatures, tempLayer)  
arcpy.SelectLayerByAttribute_management(tempLayer, "NEW_SELECTION",  
expression)  
  
# Execute Dissolve using LANDUSE and TAXCODE as Dissolve Fields  
arcpy.Dissolve_management(tempLayer, outFeatureClass, dissolveFields,  
"SINGLE_PART", "DISSOLVE_LINES")
```

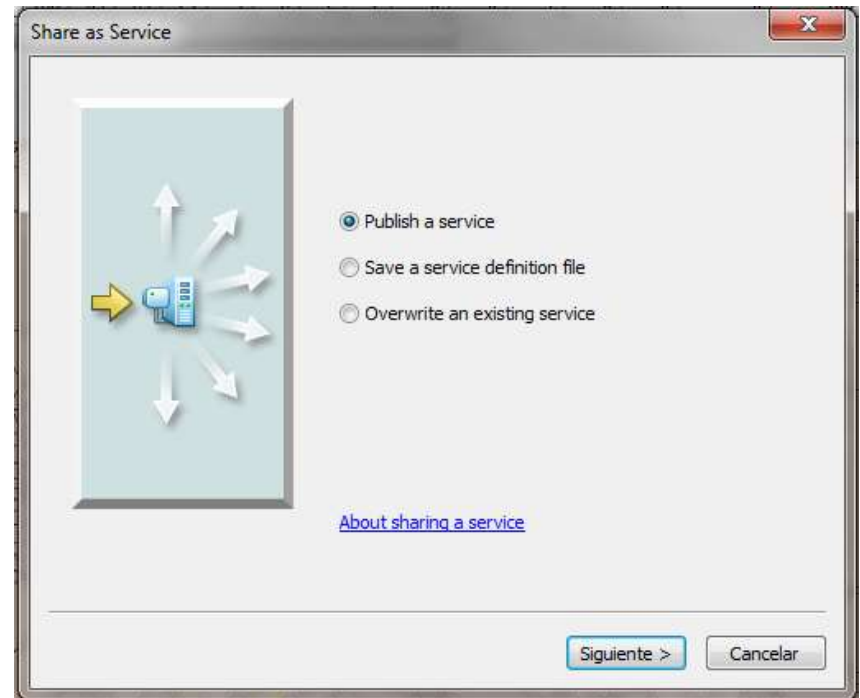
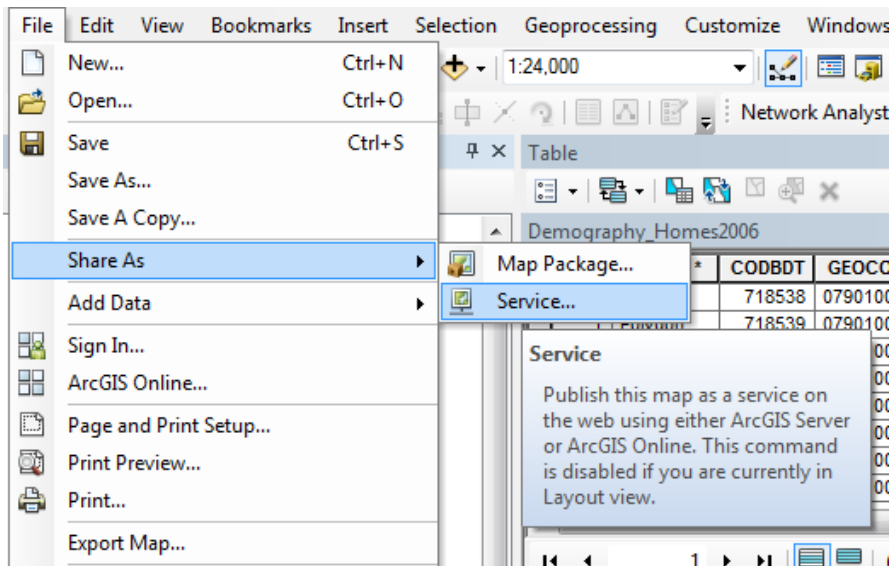
Environments

[Current Workspace](#), [Scratch Workspace](#), [Output Coordinate System](#), [Extent](#)

ArcGIS – map design

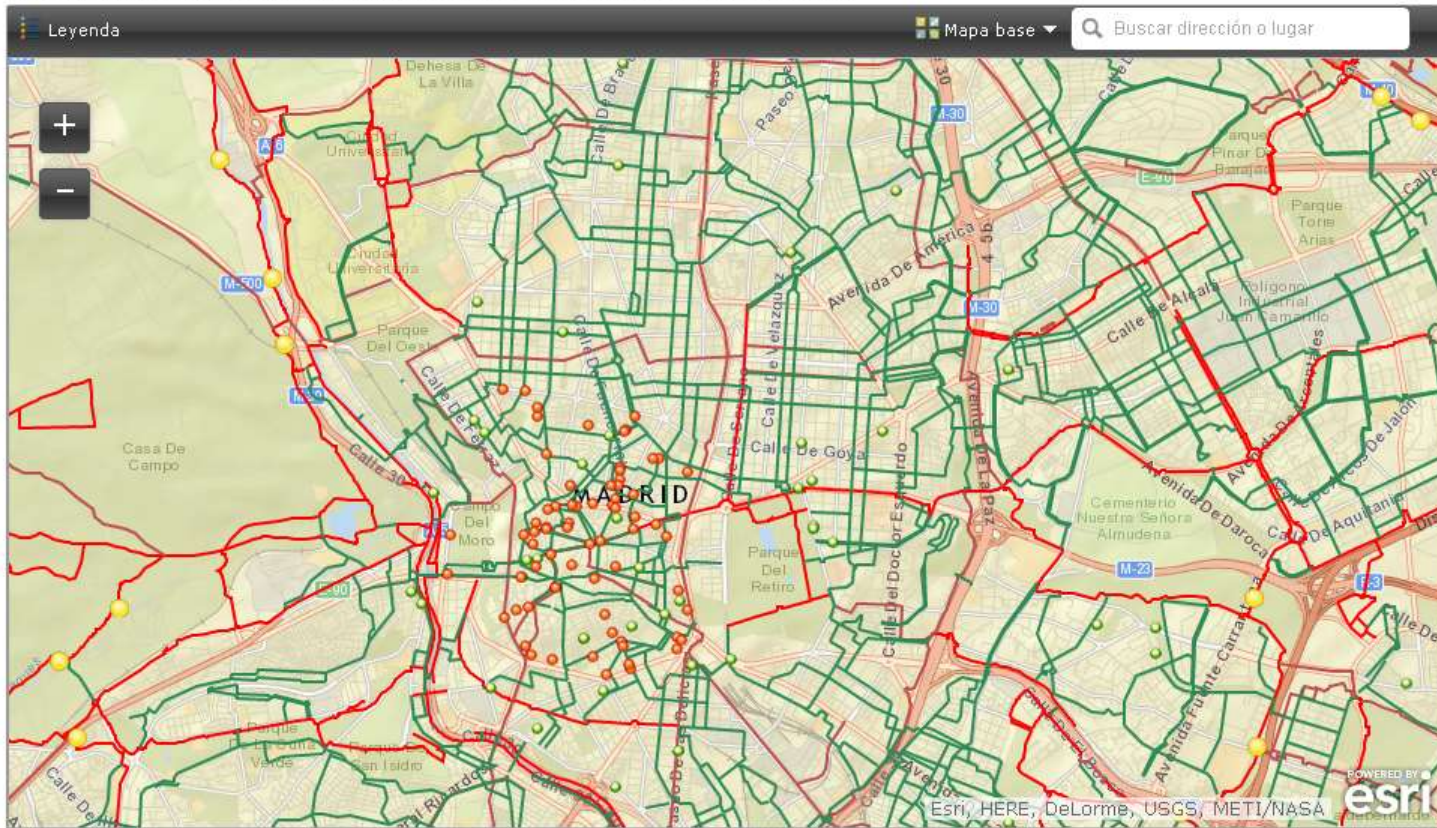


ArcGIS – share outcomes online



Mapa Ciclista

/// Mapa de las infraestructuras ciclistas de Madrid + Mapa de Calles Tranquilas ///



www.huellaciclistademadrid.es/mapa-ciclista

ArcGIS – programme

The screenshot displays the ArcGIS desktop environment. The main window shows a geoprocessing model in the 'Model' pane. The model consists of a single tool named 'Dissolve' (represented by a yellow box) which takes an input feature class 'EU_country_ETRS89_LC_C_EUROST' (represented by a blue oval) and produces an output feature class 'EU_country_ETRS89_LC_C_EUROST1' (represented by a green oval). The 'Table Of Contents' pane on the left shows the layers 'EU_country_ETRS89_LC' and 'EU_country_ETRS89_LC'. The 'Table' pane displays the following data:

FID	Shape *	OBJECTID	C
10	Polygon	62	EE
11	Polygon	65	EL

The 'Python' console at the bottom right shows the following text:

```
>>> |
```

F1 show help for current cursor location.
F2 check the syntax of the current line (or code block if in multiple line mode).
ESC cancels the current operation.
Shift or Control Return will enter multiple line mode. To exit multiple line mode (execute the

The 'ModelBuilder' pane at the top right contains the text: 'Open the ModelBuilder window so you can make a geoprocessing model. Press F1 for more help.'

The 'Results' pane on the right shows the 'Current Session' with a 'Dissolve [180706_08092014]' tool and its 'Output Feature Class: EU_country_...'.

The status bar at the bottom left indicates '1 features selected' and the bottom right shows the coordinates '2334461.437 991992.866 Meters'.

Benefits of mapping geolocalized data

- **Maps are a mean of recording and storing information.** All data that is relative to a certain place can be stored in maps and tables
- **Maps unveil spatial patterns.**
- **Maps are an effective in presenting information and communicating findings**

Workflow for the analysis of geolocalized data

- Define the question
- Look for data
- Select the methods and tools
- Perform the analysis
- Examine and improve the outcomes
- Share the outcomes

¡Muchas gracias!

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tGIS, dpto. Geografía Humana, UCM