

Title

Une base de données harmonisée pour suivre les trajectoires démographiques des villes européennes, la base TRADEVE (Trajectoires Démographiques des Villes Européennes)

A harmonized database to follow the demographic trajectories of European cities, the TRADEVE database (Demographic Trajectories of European Cities)

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Note des auteurs

Link to the original scientific article:

Abstract

TRADEVE Database provides the following information for the European Urban Morphological Zones (UMZ) of more than 10 000 inhabitants in 2011:

- Name of UMZ
- Name of country
- Code corresponding to the vectorial maps
- Population for 1961, 1971, 1981, 1991, 2001, 2011
- Accompanied by vectorial maps of the UMZ perimeters for 1961, 1971, 1981, 1991 and 2001.

TRADEVE database is based on Urban Morphological Zones (UMZ) (EEA, 2004). UMZ were enriched in the ESPON Database Project 2008-2014 by giving a name to UMZ and by creating a correspondence dictionary between UMZ and Local Administrative Units (LAU). A population density grid from the Joint Research Centre was originally used for attributing populations to UMZ.

The integration of time comes from a retropolation of UMZ 2000 back to 1961. The Historical Population Database of European LAUs allowed to attribute population for six dates (from 1961 to 2011), in the geometry of the 2012 LAU. A data model provided evolving urban perimeters from the retropolation of UMZ 2000 back to 1961. Two criteria were used: contiguity and

minimal population (2000 inhabitants) of the building blocks. The population change between 2001 and 2011 has been registered within the limits of UMZ 2000.

Keywords

Urban areas, European Union, population, spatio-temporal analysis, open data

Résumé

La base de données TRADEVE permet de suivre les informations suivantes pour les Zones Urbaines Morphologiques (UMZ) de plus de 10 000 habitants en 2011 :

- Nom de l'UMZ
- Nom du pays
- Code associé au fond vectoriel
- Population pour 1961, 1971, 1981, 1991, 2001, 2011
- ainsi que le fond vectoriel des périmètres d'UMZ pour 1961, 1971, 1981, 1991 et 2001.

La base TRADEVE s'appuie sur la base des Zones Urbaines Morphologiques (UMZ) (EEA, 2004). Dans le cadre du projet ESPON Database (2008-2014), les UMZ ont été enrichies de plusieurs manières : un nom leur a été attribué, un dictionnaire de correspondance entre les UMZ et les unités administratives locales (LAU) a été créé et une population leur a été affectée à l'aide de la grille de population du Joint Research Centre. L'intégration du temps dans TRADEVE est issue d'une rétopolation des UMZ 2000 jusqu'en 1961. L'attribution des populations aux 6 dates (de 1961 à 2011) a été permise par l'exploitation de la base de données historique des unités administratives locales (LAU), dans la géométrie des LAU de 2012. L'évolution des périmètres urbains a été déduite d'un modèle de données décrivant la rétopolation des UMZ 2000 jusqu'en 1961. Deux critères ont été utilisés: la contiguïté et la population minimale (2000 habitants) des unités administratives locales. Les changements de population entre 2001 et 2011 ont été enregistrés dans les limites des UMZ 2000.

Mots-clés

agglomérations, Union européenne, population, analyse spatio-temporelle, données ouvertes

Index geo
908

Language

Language used by the data set: English

Theme

Topic (s) of the dataset: Urban areas, Europe, population, demographic evolution, spatiotemporal analysis, evolving database.

Spatial coverage

29 European countries (UE + Switzerland, 3962 entities in 2011)

Time coverage

- Time lapse. Period of time covered by the geographic resource: 1961-2011 (6 dates)
- Publication date. Date of publication of the geographical resource. 2018
- Latest update. Date of the last revision, if applicable. May 2015.

Total number, population and area of urban areas in TRADEVE database (1961-2011)

Date	Number of urban areas	Population of urban areas (inh.)	Area of urban areas (sq km)
1961	3982	236 035 305	567 366
1971	3975	269 939 288	571 852
1981	3969	290 877 386	575 176
1991	3966	301 389 708	577 195
2001	3962	308 122 638	578 410
2011	3962	321 082 306	578 410

Format name and version

One csv file, version 1

File's format

Three series of files are provided:

Files names	Type of data	Description
UA_perimeter1961.shp UA_perimeter1971.shp UA_perimeter1981.shp UA_perimeter1991.shp UA_perimeter2001.shp UA_perimeter2011.shp With all related files (.prj, .shx, .dbf, .qpj) for each date	vector data	Urban areas perimeters for 1961, 1971, 1981, 1991, 2001, 2011 (identical to 2001) Related population data (for current and former dates)
TRADEVE_UrbanArea_Europe_1961_2011.xls	tabular data	Population and area of Urban areas for 1961, 1971, 1981, 1991, 2001, 2011 Metadata
Script_Tradeve.R Rpostgis_Functions.R	script data	Script for Urban areas retropolation and for using PostGIS data in R

Creation date

The data set was created in 2016

Dataset creator

Anne Bretagnolle (university Paris 1 Panthéon-Sorbonne, UMR Géographie-cités), Marianne Guérois (university Paris Diderot, UMR Géographie-cités), Antonin Pavard (university Paris Est, Institut de Recherche en Constructibilité (IRC), Ecole Spéciale des Travaux Publics (ESTP))

Name and function developed by the person responsible for the resource

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Responsible organization and person

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Repository location

<http://tradeve.parisgeo.cnrs.fr>

Licence

Data are made available under the creative commons license of type CC BY-NC-ND 3.0

Use

Comparison with other European databases (Bretagnolle et al. 2016)

Bretagnolle A., Guérois M., Pavard A., Gourdon P., Zdanowska N., et al. 2016, *Demographical Trajectories of European urban areas (1961-2011) (TRADEVE)*. [Research Report] Université Paris 1 Panthéon-Sorbonne. <https://halshs.archives-ouvertes.fr/halshs-01311420/document>

Gibrat/Pareto models (Cura et al. 2017).

Cura R., Cottineau C., Swerts E., Ignazzi C., Bretagnolle A., Vacchiani-Marcuzzo C., Pumain D., 2017, "The old and the new. Qualifying city systems in the world with classical models and new data", *Geographical Analysis*, 49/4, pp. 363-386.

Hierarchical and regional expressions of urban growth + cluster analysis on demographic trajectories (1961-2011)

Guerois M., Bretagnolle A., Pavard A., Gourdon P., Zdanowska N. (2018), « Following the population of European urban areas in the last half century (1961-2011): the TRADEVE database », *Cybergeogeo*, to be published

Multi-scalar urban-rural typology + classification of age structure in 2000

Bretagnolle, A., Guérois, M., Pavard, 2019, "European small cities and towns: a territorial contextualization of vulnerable demographic situations (1981-2011)", *Revue d'Economie Régionale et Urbaine*, vol. 3, to be published.

Reuse potential

Any analysis related to European urban systems: to our knowledge this is the only open access comprehensive data base delineating urban agglomerations of all sizes above 10 000 inhabitants in a systematic way and enabling their comparison in Europe at different dates (with evolving perimeters).

Possible deeper analysis of a specific hierarchical level (for instance demographic evolution of small urban areas) or a set of countries

Type of spatial representation

- vector (vector): Vector data

- text table (textTable): Text or tabular data

Spatial resolution (scale or minimum cartographic unit)

Urban area (morphological + administrative + statistical definition of cities)

Reference system

Code: EPSG: 3035

Name: ETRS89 / ETRS-LAEA

Authority: European Petroleum Survey Group (EPSG)

Geographic extension

North: 5136005,024400 m

South: 948100,364900 m

West: 1596701,786700 m

East: 6503071,449900 m

Source

Three different databases were used in the TRADEVE project:

- (i) Historical Populations Data of LAU for 1961, 1971, 1981, 1991, 2001 and 2011 (see Gloersen et al. 2013, open access)
- (ii) Urban Morphological Zones 2000, defined from the European Environment Agency (EEA) in 2004 (version v2) (see Bretagnolle et al. 2014). Open access.
- (iii) Dictionary of correspondence LAU2/UMZ (restricted version, see Figure II 1 of the Tradeve report, <https://halshs.archives-ouvertes.fr/halshs-01311420/document>) elaborated in ESPON Database (see Bretagnolle et al. 2014). It concerns UMZ 2000 and LAU2 (2012 geometry) and gives the different LAU2 that are linked to UMZ 2000. Open access.

References :

Bretagnolle A., Guérois M., Mathian H., Pavard A. (2014), *UMZ: a data base now operational for urban studies (M4D improvements)*. Technical report, 30 June 2014, downloadable from ESPON Database website <http://database.espon.eu/db2/resource?idCat=31>, 33 pages.

Gloersen E., Lüer C. (2013), *Population Data Collection for European Local Administrative Units from 1960 onward*. Final Report – Data are available on Eurostat’s website: <http://ec.europa.eu/eurostat/web/nuts/local-administrative-units>

Format for metadata

Title			text	Une base de données harmonisée pour suivre les trajectoires démographiques des villes européennes, La base TRADEVE (Trajectoires Démographiques des Villes Européennes)
Abstract			text	The TRADEVE database gives populations, surfaces and geometries of urban areas from 1961 to 2011, larger than 10 000 inhabitants, 29 European countries (3962 entities in 2011), with evolutive perimeters of urban areas.
Temporal reference				
	Time lapse			
		time_begin	date	01-01-1961
		time_end	date	01-01-2011
	Publication date		date	01-01-2019
	Latest update		date	01-01-2016
	Creation date		date	01-01-2016
Responsible organization			text	Anne Bretagnolle (university Paris 1 Panthéon-Sorbonne, UMR Géographie-cités), Marianne Guérois (university Paris Diderot, UMR Géographie-cités), Antonin Pavard (university Paris Est, Institut de Recherche en Constructibilité (IRC), Ecole Spéciale des Travaux Publics (ESTP))
Responsible role			text	See « Responsible organization »
Keywords			text	Urban areas, Europe, population, surface, evolving perimeters
Use			text	Any analysis related to European urban systems + possible deeper analysis of a

				specific hierarchical level (for instance demographic evolution of small urban areas) or a set of countries
Type of spatial representation			controlled list	vector - table - –script text
Spatial resolution (scale or minimum cartographic unit)			text	Urban area (morphological + administrative + statistical definition of cities)
Language			text	English
Themes			text	Urban areas, Europe, population, demographic evolution, spatiotemporal analysis, evolving database
Geographic extension			text	29 European countries
	min y		number - float	948100,364900 m
	min x		number - float	1596701,786700 m
	max y		number - float	5136005,024400 m
	max x		number - float	6503071,449900 m
Reference system			text	ETRS89 / ETRS-LAEA (EPSG code: 3035)
Source			text	3 databases were used: 1) Urban Morphological Zones 2000, defined from the European Environment Agency (EEA) in 2004 (version v2) and enriched by ESPON Database project (Bretagnolle et al. 2014), 2) Historical Populations Data of LAU (Gloersen et al., 2013) 3) Dictionary of correspondence LAU2/UMZ (see Bretagnolle et al. 2014)

Acknowledgements

This database results from the TRADEVE project « Demographical trajectories of European urban areas » (TRAjectoires DEMographiques des Villes Européennes) which was granted by University Paris 1 Panthéon-Sorbonne for the 2014-2016 period.

For more details, see:

Guerois M., Bretagnolle A., Pavard A., Gourdon P., Zdanowska N. (2019, forthcoming), « Following the population of European urban areas in the last half century (1961-2011): the TRADEVE database », *Cybergeo*

Full methodology in TRADEVE report: Bretagnolle A., Guérois M., Pavard A., Gourdon P., Zdanowska N., et al. 2016, *Demographical Trajectories of European urban areas (1961-2011) (TRADEVE)*. [Research Report] Université Paris 1 Panthéon-Sorbonne. <https://halshs.archives-ouvertes.fr/halshs-01311420/document>